



DANGEROUS CARGOES STANDARD

Port of Fremantle
April 2020

Fremantle Ports Dangerous Cargoes Standard (April 2020)

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The information contained within this document is believed to be reliable and accurate at the time of publication but may be subject to variation. It is recommended that persons involved in the handling and transport of dangerous cargoes seek confirmation by appropriate reference to the relevant acts and regulations, standards, codes, and consultation with the appropriate Regulatory Authority.

Harbour Master's direction

Compliance with *Australian Standard AS 3846 - The handling and transport of dangerous cargoes in port areas* is a direction of the Fremantle Ports Harbour Master.

It is an offence to fail to comply with the Harbour Master's direction without a reasonable excuse. If you fail to comply with the Harbour Master's direction, then the Harbour Master may cause the direction to be complied with and recover all reasonable expenses associated with cost of performing the direction as a debt in civil jurisdiction.

The Fremantle Ports Harbour Master has powers under the *Port Authorities Act 1999*, pursuant to section 105 whereby the Harbour Master may give direction if the Harbour Master reasonably considers it necessary to give direction to ensure that the safety of people and property in the port is not endangered by dangerous things and to ensure the operations of the port in relation to vessels are conducted safely and efficiently.

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OVERVIEW OF FREMANTLE PORTS

The Port of Fremantle is Western Australia's largest general cargo port, and one of the fastest growing general cargo ports in Australia. It covers 383 square kilometres of land and water (see Figure 1).

Fremantle Ports, a Western Australian Government owned trading enterprise, is the strategic manager with responsibility for ensuring that port services and facilities are provided and maintained in a reliable, competitive and efficient manner. Fremantle Ports' administrative headquarters are located on Victoria Quay within Fremantle's Inner Harbour.

Fremantle Ports operates over two geographic areas: the Inner Harbour located adjacent to the city of Fremantle at the entrance to the Swan River (see Figure 2 and 3), and the Outer Harbour deep-water bulk port facilities at Kwinana-Cockburn Sound (see Figures 4, 5 and 6). The Inner Harbour has been operating since 1897 and the Outer Harbour port facilities began operations in 1955, expanding rapidly in the 1960s and 70s to service the Kwinana industrial area. Both Inner and Outer Harbours are linked by rail to the interstate and intrastate rail networks.

The Inner Harbour facilitates container trade, break-bulk cargo, livestock exports and motor vehicle imports as well as accommodating cruise ships and visiting naval vessels. The two container terminals in North Quay covering Berths CT 1-4 are operated by DP World and Patrick, under lease agreements with Fremantle Ports. The Inner Harbour caters for all classes of containerised dangerous cargoes and also for bulk flammable liquids. The Inner Harbour also has a number of common-user berths for a variety of bulk and break-bulk commodities.

The Outer Harbour at Kwinana is one of Australia's major bulk cargo ports handling grain, petroleum, liquid petroleum gas (LPG), alumina, iron ore, mineral sands, sulphur fertilisers, chemicals and other bulk commodities. Three jetties in the Outer Harbour are independently owned facilities operated by Alcoa, BP and CBH (Co-operative Bulk Handling) under State Agreements. Fremantle Ports owns and operates the Kwinana Bulk Jetty and Kwinana Bulk Terminal facilities which handle a range of imports and exports. For example, dangerous cargoes handled at the Kwinana Bulk Jetty include corrosive liquids, flammable liquids, fertilisers, ammonium nitrate and anhydrous ammonia.

Fremantle Port is a mix of both government and privately owned facilities and services. Fremantle Ports provides and maintains shipping channels, navigation aids, cargo wharves, road and rail transport infrastructure within the port area, moles and seawalls and other port infrastructure such as buildings, water, power and public amenities. The Fremantle Passenger Terminal on Victoria Quay is owned and managed by Fremantle Ports. Other services provided directly by Fremantle Ports include ship scheduling and berthing allocation, port communications, mooring, stevedoring at the Kwinana bulk berths, security services, emergency response, hazardous cargo services over common-user berths, property services, quarantine and waste disposal services.

Services provided by the private sector include container stevedoring, bulk and break-bulk stevedoring, towage, line boats, bunkers, ships providers, road and rail transport, shipping agencies, freight forwarding, customs clearance and fumigation services. Pilot transport is provided by Fremantle Ports while pilotage is provided by a private company under contract. Customs, quarantine and Australian Maritime Safety Authority activities are carried out by the respective Federal Government agencies in the port area.

Figure 1 Fremantle Port boundary map



Figure 3 Fremantle Outer Harbour map



Figure 4 Fremantle Inner Harbour aerial photograph (Swan River, City of Perth in background)



Figure 5 Fremantle Inner Harbour aerial photograph (seaward)



Figure 6 Kwinana Bulk Terminal aerial photograph



Figure 7 Kwinana Bulk Jetty aerial photograph



1 INTRODUCTION

1.1 Purpose

The purpose of this document is to provide guidance for all parties involved in shipping dangerous cargoes through the Port of Fremantle as to the regulatory and safety requirements applicable to the handling and transport of dangerous cargoes so that:

- dangerous cargoes are handled and transported safely
- there are no inadvertent breaches of the applicable laws
- all parties have sufficient information regarding the applicable requirements to facilitate the planning and movement of such cargoes.

1.2 Scope

This document provides information applicable to the handling and transport of dangerous cargoes within the Port of Fremantle in the State of Western Australia.

The information provided in this document is primarily based on:

- *AS 3846 The handling and transport of dangerous cargoes in port areas*
- Western Australian legislation including *Dangerous Goods Safety Act 2004, Port Authorities Act 1999, Occupational Safety and Health Act 1984*, and associated regulations
- national legislation including *Navigation Act 2012 and Marine Orders, and Protection of the Sea (Prevention of Pollution from Ships) Act 1983*
- *the International Maritime Dangerous Goods Code (IMDG Code) and other relevant IMO Codes, and the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code,) Australian Code for the Transport of Explosives by Road and Rail (AE Code)*
- risk assessments undertaken in respect of dangerous cargoes in the port as well as specific cargo operations such as anhydrous ammonia, bulk LPG and ammonium nitrate.

1.3 Dangerous cargoes

The definition of 'dangerous cargoes' specified in AS 3846 includes substances and articles intended to be shipped by marine transport that are oils, gases, noxious liquids or wastes, dangerous goods, hazardous and harmful substances, marine pollutants, or solid materials that are hazardous when shipped in bulk. This definition does not include fuel or dangerous goods required for the operation, safety or maintenance of a vessel and forming part of a vessel's stores or equipment.

Dangerous cargoes (Definition from AS 3846—2005 1.4.20) - Any of the following cargoes, whether packaged, or in bulk containers, or in bulk, and within the scope of the following:

- ***Oils, covered by Annex I of MARPOL 73/78.***
- ***Gases, covered by the Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code).***
- ***Noxious liquid substances or chemicals, including wastes, covered by the Codes for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code) and Annex II of MARPOL 73/78.***
- ***Dangerous goods, hazardous and harmful substances, materials and articles including environmentally hazardous substances (marine pollutants) and wastes, covered by the International Maritime Dangerous Goods Code (IMDG Code).***

- **Solid bulk materials possessing chemical hazards and solid bulk materials hazardous only in bulk (MHBs), including wastes, covered by the Code of Safe Practice for Solid Bulk Cargoes (BC Code).**

The term ‘dangerous cargoes’ includes any empty, uncleaned packagings (e.g. tank containers, receptacles, intermediate bulk containers (IBCs), bulk containers, portable tanks or tank vehicles) that have previously contained dangerous cargoes, unless the packagings have been cleaned of residue of the dangerous cargoes and purged of vapours so as to nullify any hazard, or have been filled with a non-dangerous substance.

The following substances are subcategories of dangerous cargoes:

Dangerous goods

Dangerous goods are a major subset of dangerous cargoes. Dangerous goods may be pure chemical substances or mixtures, and articles such as manufactured fireworks. Dangerous goods classification is based on the most significant and immediate hazard of the goods such as fire, explosion, corrosion, and toxicity, that presents the greatest threat to human health and safety, infrastructure and/or their means of transport.

Dangerous goods as defined in AS 3846 are substances and articles that:

- are listed in the ADG Code or
- satisfy the United Nations Manual of Tests and Criteria (UN criteria) for determining whether they are dangerous goods or
- are determined to be dangerous by the competent authority.

There are nine categories of dangerous goods, known as classes and may be further subdivided into ‘divisions’ (see Table 1). DG’s are designated to a class/division by their most significant and immediate hazard. Goods with additional hazards are assigned a second class/ subsidiary risk.

Hazardous substances

Many dangerous goods are also classified hazardous substances but the terms should not be confused as they are classified according to different criteria. Hazardous substances classification is based on the health effects, particularly in relation to people in workplaces. Hazardous substances may be in the form of a gas, dust, fibres, vapours, smoke and fumes and chemical substances and often have a related ‘exposure standards’ representing airborne chemical concentrations of substances which should guard against negative health effect on workers. The nine categories of hazards and the symbols are shown adjacent.



Environmentally harmful substances (marine pollutants)



Marine pollutants are substances harmful to the marine environment. For the purposes of dangerous cargoes, harmful substances are those which are identified as marine pollutants in the IMDG Code, and harmful substances in packaged form covered by Annex III of MARPOL 73/78 or which meet the criteria in the Appendix of this Annex. Certain marine pollutants have an extreme pollution potential and are identified as severe marine pollutants.

Hazardous bulk cargoes

For the purposes of shipping the definition of dangerous cargoes also includes materials that are hazardous when shipped in bulk including gases, noxious liquid substances or chemicals, solid bulk materials possessing chemical hazards and solid bulk materials hazardous only in bulk (MHBs), and wastes.

Table 1 Classes and divisions of dangerous goods

Class diamond	Class/ Division	Description	Examples
	1	Explosives	Explosives, detonators, fireworks, signal flares, ammunitions, weapons cartridges
	2.1	Flammable gases	LPG, LNG, acetylene, butadiene, propane, hydrogen
	2.2	Non-flammable non-toxic gases	Nitrogen, argon, neon
	2.3	Toxic gases	Chlorine, ammonia, sulphur dioxide, carbon monoxide, methyl bromide
	3	Flammable liquids	Petroleum products, kerosene, solvents, adhesives, resins, paint, carbon disulphide
	4.1	Flammable solids	Xanthates, nitrocellulose, magnesium, safety matches
	4.2	Substances liable to spontaneously combust	Sulphur, zinc, aluminium alkyls, white phosphorus
	4.3	Substances which, in contact with water, emit flammable gases	Sodium, potassium, calcium, calcium carbide
	5.1	Oxidising substances	Ammonium nitrate, calcium hypochlorite, hydrogen peroxide, potassium permanganate
	5.2	Organic peroxides	MEKP (methyl ethyl ketone peroxide), benzoyl peroxides
	6.1	Toxic substances	Sodium cyanide, potassium cyanide, carbon disulphide, pesticides, poisons
	6.2	Infectious substances	Infectious substances, biological samples, virus culture, pathology specimens, used needles
	7	Radioactive substances	Monazite, tantalite, uranium, plutonium
	8	Corrosive substances	Sulphuric acid, hydrochloric acid, potassium hydroxide, sodium hydroxide, caustic soda, car batteries
	9	Miscellaneous dangerous goods, substances and articles	Bitumen, dry ice, asbestos, air-bag inflators, self-inflating life rafts

1.4 Legislative framework

Dangerous cargoes are subject to international, national, state and local requirements. **Figure 7** provides an overview of the legislation relating to dangerous cargoes. In Australia, dangerous goods are subject to requirements under Commonwealth legislation as well as that of individual States and Territories.

Figure 7 Overview of legislation relating to dangerous cargoes



International

UN - The United Nations and its specialised agencies provide international regulation standards for the transport of dangerous goods by all modes. The *UN Recommendations on the Transport of Dangerous Goods* (known as the *Orange Book*) provides an internationally accepted standard of technical criteria for classification of dangerous goods and minimum specifications for the transport of dangerous goods by all modes. The recommendations themselves are not obligatory, but form the basis of several international agreements and may be implemented by regulatory bodies in national law. The *Australian Code for the Transport of Dangerous Goods by Road and Rail* (ADG Code) complies with this standard.

IMO - The International Maritime Organisation (IMO) is a specialised agency of the UN which promotes cooperation among governments and the shipping industry to improve maritime safety and prevent marine pollution. The IMO provides guidance and regulation for the sea transport of dangerous goods including

publishing the International Maritime Dangerous Goods Code (IMDG Code), producing new conventions and amending existing maritime conventions as necessary to keep them up to date.

Two of the most significant of the international maritime conventions in force today are SOLAS 74 and MARPOL 73/78. Under these conventions the IMDG Code has been mandatory since 1 January 2004. Observance of the Code ensures compliance with the mandatory provisions of the SOLAS Convention and of Annex III of MARPOL.

SOLAS 74 - *The International Convention on the Safety of Life at Sea* is generally regarded as the most important of all international treaties concerning maritime safety. Signatory states require that merchant ships flagged by them comply with minimum safety standards in construction, equipment and operation. The first version was adopted in 1914 following the infamous capsizing of the cruise-liner *Titanic*, which resulted in more than 1,500 deaths. Several amendments followed until 1974 when a new version of SOLAS was adopted and entered into force in 1980.

MARPOL 73/78 - *The International Convention for the Prevention of Pollution from Ships of 1973, as modified by the Protocol of 1978* is the most important international regulation for preventing pollution of the marine environment by oil from ships due to accidental or operational reasons. MARPOL was adopted by IMO in 1973, absorbing the *International Convention for the Prevention of Pollution of the Sea by Oil* (OILPOL, 1954) and its amendments, and after a series of tanker accidents led to the formulation of the 1978 MARPOL Protocol; the finally combined version is known as MARPOL 73/78.

IMDG Code - *The International Maritime Dangerous Goods Code for transportation on the high seas of hazardous materials* was a cooperative product of the UN Committee of Experts on the Transport of Dangerous Goods (UNCOE) and the IMO Maritime Safety Committee working group on the carriage of dangerous cargo. First published in 1965, the Code became mandatory in international law from 1 January 2004. The IMDG Code is aligned with the basic principles of the *Orange Book* but is modified to accommodate unique aspects of maritime transport and contains guidance on stowage, segregation, handling requirements, vessel requirements and emergency procedures.

The IMDG Code is supported by a variety of international codes and publications such as the *Recommendation on the Safe Transport of Dangerous Cargoes and Related Activities in Port Areas*. These recommendations in particular are intended to align with relevant IMO codes and the IMDG Code in particular, to harmonise the rules within the port area with the ship operations. The recommendations are non-obligatory guidelines that may be implemented by national or state legislation.

Australia

Relevant Australian legislation includes the *Australian Maritime Safety Authority Act 1990*, *Navigation Act 2012*, *Carriage of Goods by Sea Act 1991*, *Protection of the Sea (Prevention of Pollution from Ships) Act 1983*, *Marine Transport and Environment Protection and Biodiversity Conservation Act 1999*.

Australian Standard 3846: The handling and transport of dangerous cargoes in port areas is applied at most Australian ports. This standard was developed to complement the *IMO Recommendations on the Safe Transport of Dangerous Cargoes and Related Activities in Port Areas*.

AS3846 sets out the principal requirements for handling dangerous cargoes in ports including:

- notifying port authorities of dangerous cargo shipments
- general requirements and procedures for the safe handling of dangerous cargoes
- segregating incompatible products
- time constraints for products kept on the wharf (the higher the hazard the shorter the time the product may be held on the wharf)
- emergency response procedures, including firefighting resources
- management systems to cover aspects such as training and communication.

The competent authority for sea transport, the Australian Maritime Safety Authority (AMSA), is responsible for implementing the IMO regulations in Australia for all safety-related aspects of the sea transport, and developing standards, procedures and Marine Orders relating to shipping and maritime safety including the carriage of dangerous cargo including bulk liquid and solid cargoes, general cargoes, and containers as well as emergency response plans. Under the *Australian Maritime Safety Authority Act 1990*, AMSA's role includes protection of the marine environment from pollution from ships and other environmental damage caused by shipping.

The *National Marine Oil Spill Contingency Plan* (NATPLAN) and the *National Marine Chemical Spill Contingency Plan* (CHEMPLAN) outline the process for dealing with spills and accidents and provide a framework for state response plans and include a process for activating National Plans in the case of a major accident involving ship-sourced chemical, oil and other noxious and hazardous substances.

The road and rail transport of dangerous goods in Australia is given national uniformity by the Australian National Transport Commission (NTC) which produces the ADG Code as well as model legislation for the road and rail transport of dangerous goods intended for each State and Territory to adopt and enforce. The ADG Code is mandatory for land transport of dangerous goods including transport to and from the port area, until the product reaches its destination.

Western Australia

The *Dangerous Goods Safety Act 2004* (the Act) and associated regulations are the principle legislation which applies to dangerous goods in Western Australia, and are administered by Department of Mines, Industry Regulation and Safety. AS3846 is an approved code of practice under the Act and in addition both the storage and handling regulations and explosives regulations reference or 'prescribe' specific parts of AS3846. Further requirements for dangerous goods in a port area include dangerous goods site licencing and emergency planning requirements.

Under the Western Australian Emergency Management Regulations 2006, the State emergency management arrangements include the *Western Australian Hazardous Materials Emergency Management Plan* (WESTPLAN – HAZMAT) and *Marine Oil Pollution Emergency Management Plan* (WESTPLAN – MOP). Department of Fire and Emergency Services (DFES) is the designated Hazard Management Agency for emergencies involving hazardous materials with technical advice provided by the HAZMAT Coordinating Committee.

Other relevant state legislation includes the *Port Authorities Act 1999*, Port Authorities Regulations 2001, *Occupational Safety and Health Act 1984* and Regulations. In Western Australia, hazardous substances are regulated under the *Occupational Safety and Health Act 1984* administered by WorkSafe except for hazardous substances used at mining operations which are regulated under the *Mines Safety and Inspection Act* administered by the Department of Mines, Industry Regulation and Safety (DMIRS).

Fremantle Ports

Fremantle Ports Safety Management System includes:

- emergency response training, including oil response drills
- a Security Centre staffed 24 hours a day with trained personnel
- auditing and monitoring of activities relating to dangerous cargo operations
- quantitative risk assessments for dangerous cargo port operations and specific cargo operations, as well as regular reviews of the Inner Harbour operations to ensure the Environmental Protection Authority's public risk criteria are not exceeded as a result of dangerous cargoes throughput
- *Fremantle Ports Incident Management Plan* - is a comprehensive emergency response and evacuation plan for port areas linking berth operators' emergency response plans to the Fremantle Ports Incident Management Plan

- *Fremantle Ports Dangerous Cargoes Standard* - was first developed in 1999 and revised several times to keep abreast of requirements. (Based on AS 3846, this document provides advice to the shipping industry regarding the application of AS 3846 to Fremantle Port including any quantity limits or time restrictions for dangerous cargoes in the port area and the responsibilities for the handling of dangerous cargoes through the port.)

Berth operators

AS 3846 and the Western Australian Dangerous Goods regulations require all berth operators handling dangerous goods (including by pipeline) prepare and implement a Safety Management System and have a written emergency plan agreed to by the Harbour Master.

1.5 References

Australian Standard AS3846 - The handling and transport of dangerous cargoes in port areas

Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code)

Australian Code for the Transport of Explosives by Road and Rail (AE Code)

(Commonwealth) Navigation Act 1912

Fremantle Port Authority Quantitative Risk Assessment 2000 (DNV)

IAEA Regulations for the Safe Transport of Radioactive Material

ICS International Safety Guide for Oil Tankers and Terminals (ISGOTT)

IMO Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk

IMO Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk

IMO Code of Existing Ships Carrying Liquefied Gases in Bulk

IMO Code of Practice for the Safe Loading and Unloading of Bulk Carriers (BLU Code)

IMO International Maritime Dangerous Goods Code (IMDG Code)

IMO International Maritime Solid Bulk Cargoes Code (IMSBC Code) (supersedes the BC Code)

IMO Recommend' on the Safe Transport of Dangerous Goods & Related Activities in Port Areas

International Convention for the Prevention of Maritime Pollution (MARPOL 73/78)

International Convention for the Safety of Life at Sea (SOLAS)

International Labour Organization (ILO) Code of Practice on Safety and Health in Ports

AMSA Marine Orders (parts 21, 32, 34, 41, 42, 44, 58, 61)

Resources Safety's Code of Practice for the Storage and Handling of Dangerous Goods

DMP Guidance Note P01/09 - Requirements for handling ammonium nitrate at a special berth

Safe Work Australia Guides (Working Safely with Containers, Waterfront, General Cargo)

(WA) Dangerous Goods Safety Act 2004

(WA) Dangerous Goods Safety (Road and Rail Transport of Non-Explosives) Regulations 2007

(WA) Dangerous Goods Safety (Storage and handling of Non-Explosive) Regulations 2007

(WA) Dangerous Goods Safety (Security Sensitive Ammonium Nitrate) Regulations 2007

(WA) Marine Act 1982 and Marine Orders and Marine Notices

(WA) Port Authorities Act 1999 and Regulations 2001

(WA) Occupational Safety and Health Act 1984 and Regulations 1996

(WA) Mines Safety and Inspection Act 1994 and Regulations 1995

2 REQUIREMENTS FOR THE ENTRY OF DANGEROUS CARGOES INTO FREMANTLE PORTS

Voyager Dangerous Cargo

The 'advance notification' and 'request for permission' requirements are completed by shipping agents using the Fremantle Ports Voyager Dangerous Cargo (VDC) system available on the Fremantle Ports internet site www.fremantleports.com.au

2.1 Advance notification of dangerous cargoes

At least 48 hours advance notification should be given for any dangerous cargo intended to be brought into port waters or onto a berth. This is required for all dangerous cargoes intended to be loaded or unloaded as well as transit cargoes.

2.2 Request for permission for high hazard dangerous cargoes

Permission from Fremantle Ports must be obtained for all high hazard dangerous cargoes before they are moved through the port. If your cargo is not high hazard dangerous cargoes a permission is not required.

Permission should be sought well before the advance notification of such shipments and in some instances during the planning stage. Cargoes are considered to be high hazard due to one or more of the following:

- special hazards associated with the cargoes
- the need to ascertain the conditions under which cargo entry may be permitted
- the need to liaise with or to seek approval from other regulatory authorities
- the need to undertake specific risk assessment or to ensure appropriate Safety Management Systems are in place before handling of the cargo
- the need to coordinate port services, emergency resources and other shipping movements.

Table 2 provides a list of the high hazard dangerous cargoes.

Table 2 - High hazard dangerous cargoes which require permission before entering port

Class	High hazard dangerous cargoes
1	All Class 1 explosives (excluding Division 1.4).
2	Bulk Class 2 gases (excluding Division 2.2 transit cargoes)
	Containerised Division 2.3 toxic gases quantities exceeding 500 kg (excluding cylinders), and transit quantities exceeding 25,000 kg (excluding cylinders, drums)
4	Bulk Class 4 flammable substances
5	Bulk Class 5 substances and containerised Class 5 Packing Group I substances in quantities exceeding 400 tonnes
	Containerised ammonium nitrate (UN 1942, UN 2067) in quantities exceeding 750 tonnes or break-bulk in quantities exceeding 150 tonnes
	Containerised calcium hypochlorite in quantities exceeding 30 tonnes
6	Bulk Division 6.1 toxic substances
	All Division 6.2 infectious substances
7	All Class 7 radioactive substances (excluding transit cargoes)
8	Bulk Class 8 Packing Group I corrosive substances
Note: Permission requirements apply for transit cargoes unless stated otherwise	

3 FREMANTLE PORTS BERTH LIMITS FOR DANGEROUS CARGOES

The following requirements are applicable to any containerised or break-bulk dangerous cargoes brought into the berth areas or terminals at Fremantle Port.

3.1 Berth quantity limits for dangerous cargoes

The operator of the berth is responsible for ensuring that any quantity restrictions which apply to dangerous cargoes are not exceeded.

Table 3 summarises the maximum permitted quantity of dangerous goods that may be loaded onto or unloaded from a ship or that may remain in the berth area.

Table 3 - Quantity limits for dangerous cargoes

Class	Quantity limits for containerised and break-bulk dangerous cargoes
1	See Table 5 for quantity limits which apply for Divisions 1.1, 1.2, 1.3 & 1.5. There are no restrictions on quantities for Division 1.4
2	No quantity limits apply to Division 2.1 and 2.2 gases Limits may need to be determined for specific shipments of Division 2.3 toxic gases, see section 5.2
5	30 tonnes of ammonium nitrate at ordinary berths See Table 7 for the special berth quantity limits for ammonium nitrate
7	No quantity limits currently apply to Class 7 Limits may need to be determined for specific shipments of Class 7 substances, see section 5.7
3, 4, 6, 8 & 9	No quantity limits apply to these classes
Quantity limits apply to transit cargo unless stated otherwise	
Note: In addition to applying these berth quantity limits, the berth operator must ensure the quantities being handled do not exceed the quantities listed on their own Dangerous Goods Site Licence and, if applicable, Special Berth declaration.	

3.2 Time limits for dangerous cargoes

All practicable efforts should be made to ensure dangerous cargoes only remain within the port area for the minimum period necessary.

The operator of the berth is responsible for ensuring that any handling of the dangerous goods is completed as soon as practicable after the vessel berths or the dangerous goods arrive on the berth and that the vessel does not remain at the berth for any longer than is reasonably necessary to complete any handling of the dangerous goods.

Table 4 provides the maximum permitted time containerised or break-bulk dangerous cargoes may remain in the terminal or berth area before being loaded or after being unloaded from a ship.

Table 4 -Time limits for containerised dangerous cargoes

Class	Containerised dangerous cargoes	Time limit
1	Class 1 Explosives (excluding Division 1.4) require immediate removal from the <u>berth area</u>	2 hours (Immediate)
	Division 1.4 are permitted to remain in the <u>berth area</u> for a maximum of 5 days. When explosives of different divisions are found in a container the 2 hour time limit applies	5 days
2	Division 2.1 and 2.3 gases in quantities exceeding 500 kg are only permitted to remain in the <u>berth area</u> for a maximum of 12 hours	12 hours
	Division 2.1 and 2.3 (in quantities less than 500 kg) and Division 2.2 (any quantity) are permitted to remain in the <u>berth area</u> for a maximum of 5 days	5 days
7	Class 7 radioactive substances must not remain within the <u>port area</u> for more than 24 hours. Further time limits may be applied depending on the specific activity of the material Class 7 time limits apply to the berth and port area	24 hours
3, 4, 5, 6, 8 and 9	Dangerous cargoes <i>Packing Group I</i> in quantities exceeding 500 kg are only permitted to remain in the berth area for a maximum of 12 hours	12 hours (Redline)
	Dangerous cargoes <i>Packing Group II and III</i> and nominally empty containers (i.e. containing 500 kg or less) of <i>Packing Group I</i> are permitted to remain in the berth area for a maximum of 5 days	5 days (Greenline)
Time limits <u>do not</u> apply to transit cargoes		
Applications for <i>Extension of Time Limits</i> or enquiries about <i>Designating a Restricted area</i> should be directed to dangerouscargoofficer@fremantleports.com.au		

Request for extension of time limits

The berth operator may apply for an extension of time limits to accommodate the holding of dangerous cargoes beyond the time limit specified. Fremantle Ports will consider each request on a case-by-case basis with approval subject to risk assessment and additional conditions.

Designating a Restricted area

The berth operator may apply to designate a restricted area for the holding of specific dangerous cargoes beyond the time limit specified, up to 5 days. The berth operator requires authorisation

from both the Port and Regulatory Authorities. Approval will be subject to suitability of the site, satisfactory risk assessment, emergency plan and procedures.

4 GENERAL REQUIREMENTS FOR THE HANDLING AND TRANSPORT OF DANGEROUS CARGOES

The requirements in this section are primarily derived from AS 3846, Dangerous Goods Safety (Storage and Handling of Non-explosive) Regulations 2007, Dangerous Goods Safety (Transport of Non-explosive) Regulations 2007, Dangerous Goods Safety (Explosives) Regulations 2007 and Occupational Safety and Health Regulations 1996.

The following requirements are applicable to any berth operators whose activities involve handling and transport of dangerous cargoes in the Port of Fremantle:

1 Safety management system

AS 3846 requires the berth operator to prepare and implement a Safety Management System that provides a management framework for safely undertaking potentially hazardous activities, minimising the likelihood of incidents, managing occupational health and safety, and assisting in the protection of people, property and the environment.

A Safety Management System (AS 3846) is a documented system of policies, procedures and records that focuses on the management of risk (both identification and controls) in relation to operational and personnel safety.

2 Risk assessment

Before starting work the appropriate authorised and qualified personnel should determine the best way to carry out the activity safely, without impacting on people, property and the environment. OSH regulations make it compulsory for employers in all workplaces to identify hazards and assess and control risks. Any potentially hazardous activity requires a job safety analysis (JSA) or a documented procedure.

AS 3846 requires formal risk assessments to be conducted in respect to some higher risk activities. A risk assessment process enables the identification, assessment and control of risks associated with dangerous cargoes. AS 3846 allows the application of formal risk assessments to support any variation from its requirements (subject to acceptance by the relevant regulatory authority) which leaves scope for equivalent measures or improvements to be justified through risk assessment. Therefore, if a particular dangerous cargo or activity involving a dangerous cargo is not specifically addressed in this standard or AS 3846, it must be assumed a formal risk assessment is required to establish appropriate requirements, limits or restrictions.

3 Emergency planning

Berth operators must ensure there is a written emergency plan for the site that documents the actions to be taken, procedures to be followed and information required to mitigate the consequences of a dangerous situation arising from the handling or transport of a dangerous cargo in a port area. The emergency plan must be developed in consultation with the Emergency Services and Fremantle Ports.

All persons engaged in handling or transporting of dangerous cargoes in a port area must be aware of the emergency plan and competent in operating any necessary response equipment that they may be required to use.

The berth operator emergency plans must be submitted to Fremantle Ports to ensure that the plans align with the overall *Fremantle Ports Incident Management Plan*. The berth operator emergency plan must include the following:

- First response - The berth operator is responsible for the initial emergency response. Berth operators have a designated area in which they are responsible for initiating the emergency response that begins when the dangerous goods have been accepted into the site and ends once the goods are removed or loaded onto vessel. Fremantle Ports will not be responsible for any containment or clean up; however, port specific information and incident management support will be available if required.
- Notifications - The Department of Fire and Emergency Services must be notified of any emergency involving hazardous materials. The berth operator should notify Fremantle Ports (Port Security Centre on 9335 1300) of all of emergencies and incidents occurring within their operational area as soon as practicable.

4 Evacuation

OSH regulations require that an emergency evacuation procedure be prepared and where practicable, practised at reasonable intervals. The berth operator evacuation procedure should be self sufficient and integrate with the port's major evacuation procedure outlined in *Fremantle Ports Incident Management Plan*.

5 Fire and emergency resources and personnel

Fire and emergency resources need to be appropriate for the type, class, packing group and quantity of dangerous cargoes. Firefighting equipment should be suitably identified and labelled, located and protected, readily available, accessible and maintained to appropriate standards and manufacturers' instructions. Where precautions for fire are in force the area should be clearly demarked by conspicuous notices. Persons at the workplace who would be required to help control or extinguish a fire at the workplace are appropriately trained and provided with appropriate protective clothing and equipment.

6 Training

Dangerous cargoes should only be handled by persons skilled in handling such cargoes, and by persons being trained who are supervised by a trained person. AS 3846 requires the berth operator to provide appropriate training (and refresher training) so that skilled personnel are employed in the handling of dangerous cargoes (and in the appropriate emergency procedures). The IMDG code provides mandatory obligations and training requirements for all shore-based personnel and managers dealing with dangerous goods (refer to IMDG Code Chapter 1.3 and training matrix 1.3.1.6).

7 Personal protective equipment, safety showers and eyewash facilities

Appropriate personal protective equipment must be readily available whenever dangerous cargoes are being handled. A safety shower and eyewash facilities must be provided ready for use whenever toxic, corrosive or skin-sensitising substances are handled in bulk.

8 Placarding and transport documentation

For transport to and from the port area, a freight container of dangerous goods or explosives consigned for transport may be placarded in accordance with the IMDG Code and is exempt from 'marking' as per the ADG code. Documentation accompanying the dangerous cargoes (for delivery by land) must be in accordance with either the ADG or IMDG Code.

9 Stowage and segregation

Containerised dangerous cargoes being prepared for transport by sea or being unloaded from a ship must be segregated in accordance with AS 3846 Table 5.4.

The IMDG Code contains guidance on stowage, segregation and vessel requirements.

10 Hazardous area restrictions

Within a hazardous area, or within 25 metres of any place where flammable dangerous cargoes are present, no person shall create or use an ignition source, or have in their possession any matches, lighters, mobile phones, pagers, spark-generating equipment or ignition source, unless permitted by Fremantle Ports.

11 Smoking precautions

Smoking is only permitted in clearly marked areas declared safe by the master, berth operator or Harbour Master.

12 Hot work

Repairs involving hot work include open fires and flames, power tools, hot rivets, grinding, soldering, burning, cutting, welding or work that involves heat or creation of sparks which may lead to a hazard because of the presence or proximity of dangerous cargoes. Activities involving hot work must not be conducted within the limits of Fremantle Port without approval of the Harbour Master (request permission to conduct hot work) and must be carried out in accordance with AS 1674.1 and AS 1674.2.

13 Confined space entry

Any activity requiring personnel, other than the ship's crew, to enter a confined space must be conducted in accordance with AS 2865.

14 Communication

For the duration of dangerous cargo handling and bunkering operations, a reliable and effective means of communication must be in place between the ship and the berth operator.

15 Inspections and audits

The regulatory authority, Fremantle Ports and/or the berth operator must be granted access to a ship or berth at any time, to conduct inspections and audits.

16 Reporting incidents

Reporting of dangerous goods incidents is the responsibility of the berth operator or those otherwise responsible for the management of the dangerous goods involved. Dangerous goods incidents must be reported to the appropriate regulatory authority within 21 days. For further information visit www.dmirs.wa.gov.au.

17 Security

Fremantle Ports has established water and landside restricted zones. All port areas shall be appropriately secured at all times against unauthorised access. Access to operational areas is limited to specific or authorised persons. Personnel may require a Maritime Security Identification Card (MSIC) to access operational areas. Additionally, personnel handling dangerous goods at worksites need to consider whether they require a dangerous goods security card (DGSC). See the Department of Mines, Industry Regulation and Safety website (www.dmirs.wa.gov.au) for further guidance.

18 Storage

The storage of dangerous goods is not permitted within the berth and terminal areas (see time limits specified in **Table 4**). Outside the berth and terminal areas AS 3846 does not apply.

19 Transport

All vehicles in the port area are expected to comply with the *Road Traffic Code*. Transport of dangerous cargoes by road and rail must be in accordance with the Dangerous Goods Safety (Road and Rail Transport of Non-Explosive) Regulations 2007 and the *Australian Code for the Transport of Dangerous Goods by Road and Rail* (ADG Code) or the Dangerous Goods Safety (Explosives) Regulations 2007 and the *Australian Code for the Transport of Explosives by Road and Rail* (AE Code).

The dangerous goods licencing regime includes licensing of drivers and registration of vehicles transporting dangerous goods. The explosives licencing regime includes licences for the driver, transport and import/export.

The transport regulations (Reg.183-186) require that a placarded dangerous goods load must be covered by an 'approved responder' to provide risk mitigation and clean-up services in response to dangerous situations resulting from incidents involving vehicles transporting dangerous goods appropriate to the class of dangerous goods being transported.

20 Dangerous goods site licencing and explosives licencing

Under the Dangerous Goods Safety (Explosives) Regulations 2007, the explosives licencing and authorisation regime includes licencing for import/export, transport, drivers and security cards.

Under the Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007, all berth operators handling dangerous goods (except Class 1 explosives, Division 6.2 infectious substance, and Class 7 radioactive materials) must hold a current Dangerous Goods Site Licence. The regulatory regime is quantity based and the requirements increase at specified thresholds:

- A 'Placard quantity' requires the operator to provide site placarding, hazard identification, a site risk assessment and compliance checks to approved codes of practice (such as AS3846) as part of the risk assessment. Specific controls must be applied such as: separation of dangerous goods from protected places (e.g. offices, warehouses); segregation of incompatible dangerous goods; spillage containment; and fire protection.
- A 'Manifest quantity' requires the operator to hold a licence for the site; have a safety management system and provide an emergency manifest and emergency plan. Additionally, operators of licensed dangerous goods sites are required to prepare an Emergency Response Guide (**FES-ERG**) with the [Department of Fire and Emergency Services](#).

5 SPECIFIC REQUIREMENTS FOR DANGEROUS CARGO TYPES

5.1 CLASS 1 - EXPLOSIVES

Overview

Class 1 dangerous goods are explosives. They are classified according to Hazard Division and Compatibility Group.

There are six Hazard Divisions indicated by numbers 1-6 which relate to the sensitivity, mass explosion hazard and projectile hazard of explosives:

- Division 1.1 - Explosives with a mass explosion hazard
- Division 1.2 - Explosives with a projection hazard but not a mass explosion hazard
- Division 1.3 - Explosives with a fire hazard and either a minor blast or projection hazards, or both, but not a mass explosion hazard
- Division 1.4 - Explosives which present no significant hazard
- Division 1.5 - Very insensitive substances which have a mass explosion hazard
- Division 1.6 - Articles containing very insensitive explosives.

The 13 Compatibility Groups are indicated by letters A-L, N and S (excluding I) which designate which explosives can be stowed or carried together with no significant increase in the probability of an accident or the magnitude of the effects of such an accident. Refer to AS 3846 Appendix F for guidance on mixed stowage for transport.

Explosives import/export

A consignee/consignor undertaking international imports/exports of explosives must hold an explosives import/export licence and notify the regulatory authority at least 7 days before the goods arrive or depart the State. Fireworks imported from interstate must be notified to the regulatory authority at least 24 hours before the fireworks arrive in this State.

Time limits

The time limits applicable to dangerous cargoes are summarised in **Table 4**. Explosives (except Division 1.4) require immediate removal from the berth area. This means that explosives cargo must be taken directly to or from the ship, and not held on a berth for more than two hours.

Handling requirements

The general requirements applicable to handling of all dangerous cargoes are listed in **Section 2**.

Explosives are regulated under the Dangerous Goods Safety (Explosives) Regulations 2007, and subject to explosives licencing regime and the requirements outlined below.

Note that Explosives Regulation 6 allows for risk assessment to be used to determine if an alternative safety measure may be applied instead of the requirements referred to in a provision of the regulations provided the alternative measure provides equivalent or improved safety.

Quantity limits

Table 5 details the berth quantity limits for each explosives division which vary for each berth.

Table 5 - Berth Quantity Limits for Class 1 explosives

Berths	Safety distance to protected places (metres)	Ordinary Berth Quantity Limits Maximum NEQ (tonnes)		
		Divisions 1.1, 1.5, 1.6	Division 1.2	Division 1.3
North Quay Berth 1	110	0.6	0.6	5.0
North Quay Berth 2	125	0.8	0.8	7.5
DP World Terminal CT1	200	1.6	1.8	30.0
DP World Terminal CT2	320	3.5	20.0	121.0
Patrick Terminal CT3	320	3.5	20.0	121.0
Patrick Terminal CT4	200	1.6	1.8	30.0
North Quay Berth 11	80	0.4	0.4	2.0
North Quay Berth 12	200	1.6	1.8	30.0
Kwinana Bulk Terminal KBB2	605	19.6	250.0	250.0
Kwinana Bulk Jetty KBB3	480	10.0	250.0	250.0
Kwinana Bulk Jetty KBB4	500	11.5	250.0	250.0

- DIVISION 1.4: Quantity limits are not required for this division as the minimum safety distance of 20 metres is achieved on all berths
- Quantity limits apply to the *Net Explosive Quantity* (NEQ) which is the total amount of explosive material contained in the cargo excluding non-explosive components and packaging materials.
- Explosives may remain on board a ship at berth or be handled at a berth if the specified berth quantity limits are applied. When the explosives cargo contains explosives of different divisions, the limits of the most restrictive division applies to all explosives.
- The *quantity limits* indicated are based on the *safety distances* given in AS 3846 Table 4.2 and Explosives Regulation 111K. Staying within the quantity limits ensures the recommended safety distance is achieved. The *safety distance* is the recommended minimum separation that must be maintained from the explosives to any *protected places* to minimise the risk of damage or injury should the explosives detonate.
- *Protected places* includes workshops, warehouse, offices, shops, stores and dangerous goods located outside the berth area, as well as public buildings and assembly areas situated within the berth area. Protected places may include other vessels or accommodation quarters on other vessels. Depending on the utilisation of adjacent berths and shipping movements, achieving the safety distance in relation to other vessels may not be possible in all instances and it is recommended the vessel be separated from other vessels on adjacent berths by at least 50 metres.
- The berth quantity limit may only be exceeded under a *declaration of special berth for explosives* approved by the regulatory authority. Fremantle Ports has no approved special berths for explosives

Berth operator requirements

The berth operator must ensure that the following requirements from AS 3846 are adhered to when explosives are handled:

- Explosives (excluding Division 1.4) must not be brought to a berth for loading onto a ship unless the ship is ready to receive them.
- Explosives (excluding Division 1.4) must not be unloaded from a ship unless the means of transport by which they are to be removed from the port area is ready to receive them.
- Explosives (excluding Division 1.4) must be taken directly to or from the ship, and not held on a berth for more than two hours.
- The handling of explosives, once commenced, must proceed without delay or interruption (except during electrical storms when handling explosives may be suspended until the storm has passed).
- The area of the berth where explosives are being handled and to a distance of 15 metres beyond the handling area, must be secured and clearly demarcated. Any personnel not required for the safe handling of the explosives shall be excluded.
- If any package, or the seal of any package of explosives, appears to be damaged, the regulatory authority must be advised and the package set aside for examination and repair or safe disposal.
- If any explosives are spilled or leak from a package, the spillage must be secured. Appropriate specialist advice to address the spill must be obtained and the regulatory authority advised.
- On completion of loading, the loaded ship, train or vehicle must leave the port area as soon as practicable.
- Explosives must be unloaded as soon as reasonably practicable.
- Smoking must be strictly prohibited on the ship and on the berth (except in safe areas). Appropriate signage must be prominently displayed.
- Repairs involving hot work must be prohibited on the ship or on the berth while explosives (excluding Division 1.4) are being transported or handled.
- **Lift trucks** - Where a lift truck is used to handle explosives (other than Division 1.4S) they must be electric/LPG/diesel powered (not petrol powered), must be fitted with spark arresters where appropriate; and must be inspected before use to ensure they are free of leaks, and attended at all times while in the cargo area.
- **Customer's representative** - Where more than 100 kg NEQ of explosives (other than Division 1.4) is loaded or unloaded in the port area, a shipper's or consignee's representative must be present who, if an incident develops, has access to expert technical advice. The representative's role should not involve a command or control position in an incident. (AS 3846 Clause 4.3.5)
- **Electrical storms** - The loading or unloading of explosives must be suspended during electrical storms. All personnel should be removed from the loading or unloading area until after the electrical storm has passed. (AS 3846 Clause 4.3.6).

Additionally, the berth operator must ensure that the following requirements from the explosives regulations are adhered to '... when the total load of explosives being handled (excluding transit cargo) includes Division 1.4 with a gross weight of 10 tonnes or more; or other explosives divisions with a gross weight of 1 kg or more':

- **Fire control equipment** - The berth operator must ensure the berth has adequate fire control equipment. Fire control equipment must be capable of extinguishing any fire that is reasonably foreseeable at the berth, always in working order, available for immediate use to extinguish a fire, and not obstructed or otherwise positioned in a manner that hinders its operation or access to it or use of it. The equipment provided can be used by any fire brigade immediately without adaptation or modification. (Explosives Regulation 111H)

- **Berth operator emergency plan** - The operator of the berth must ensure there is an emergency plan for the berth and that the emergency plan is reviewed as necessary or at intervals of not more than three years. (Explosives Regulation 1111)

Ship requirements

The Master of a vessel handling explosives must ensure compliance with the following requirements from AS 3846:

- When explosives are being handled: Explosives (excluding Division 1.4) must not be unloaded from a ship unless the means of transport by which they are to be removed from the port area is ready to receive them. The handling of explosives, once commenced, must proceed without delay or interruption (except during electrical storms when handling explosives may be suspended until the storm has passed). If any explosives are spilled or leak from a package, the spillage must be secured. Appropriate specialist advice to address the spill must be obtained and the regulatory authority advised. On completion of loading, the loaded ship must depart from the port area as soon as is reasonably practicable. Explosives must be unloaded as soon as is reasonably practicable. Repairs involving hot work are prohibited on the ship or on the berth while explosives (excluding Division 1.4) are being transported or handled.
- While explosives are on board a ship, while the ship is at berth, whether or not any cargo is being handled, the ship's engines and auxiliary equipment must be kept ready so that the ship can leave the berth at short notice if required (not applicable for Division 1.4 explosives). Unless directed otherwise, the ship must be berthed in a direction that allows the quickest departure from the berth in an emergency. Explosives must be segregated from incompatible cargoes, combustibles and other dangerous cargoes at all times.
- While explosives are being loaded or unloaded bunkering must not take place unless permitted by Fremantle Ports (except when explosives Division 1.4 are handled). Adequate and appropriate firefighting equipment and water must be immediately available on the ship with fire hoses run out ready for immediate use.

Fire and emergency preparation

The minimum levels of firefighting equipment and response personnel required during the handling of dangerous goods are outlined in **Appendix A**.

Fire control equipment is required for explosives of Division 1.4 with a gross weight more than 10 tonnes; other explosives divisions with a gross weight of 1 kg or more.

Transport of explosives by road or rail

The transport of explosives and the vehicles used to transport explosives are to be in accordance with the Explosives Regulations and chapter 6 of the Australian Code for the Transport of Explosives by Road and Rail (AE Code)

Explosives licences are required for the transport of explosives and for drivers. In addition, the prime contractor for the transport of explosives must ensure that the following requirements from AS 3846 are adhered to:

- If any explosives are spilled or leak from a package, the spillage must be secured. Appropriate specialist advice to address the spill must be obtained and the regulatory authority advised.
- On completion of loading, the loaded vehicle must depart from the port area as soon as is reasonably practicable.

5.2 CLASS 2 – COMPRESSED AND LIQUEFIED GASES

Overview

Class 2 comprises compressed gases, liquefied gases, dissolved gases, refrigerated liquefied gases, mixtures of gases and vapours of substances of other classes, articles charged with gas and aerosols. To store, handle and use gases effectively they are normally compressed or liquefied. Liquefaction can be achieved by either refrigeration (e.g. bulk anhydrous ammonia) or by pressurisation (e.g. LPG).

Gases classified as dangerous goods are divided into three divisions according to their predominant hazard:

- Division 2.1 - Flammable gases
- Division 2.2 - Non-flammable, non-toxic gases
- Division 2.3 - Toxic gases.

Compressed and liquefied gases are hazardous due to one or more of the following:

- their flammable properties when mixed with air
- their toxic properties
- their displacement of oxygen in the air and potential to cause asphyxiation
- their stored energy from being held under very high pressure
- their potential to cause freezing when released or vaporised.

Gases do not have a Packing Group designation like other classes of dangerous goods as they are normally packaged in appropriate metal containers (such as cylinders, drums or ISOtainers) for which there are specific standards dependent on the properties of each gas.

Quantity limits

The quantity limits applicable to all dangerous cargoes are summarised in **Table 3**.

Note specific risk assessments may be required in order to determine berth quantity limit for Class 2 gases in bulk and division 2.3 toxic gases.

Time limits

The time limits applicable to all containerised dangerous cargoes are summarised in **Table 4**.

Handling requirements

The general requirements applicable to handling of all dangerous cargoes are listed in **Section 2**.

Fire and emergency preparation

The minimum levels of firefighting equipment and response personnel required during the handling of dangerous goods are outlined in **Appendix A**.

SPECIAL REQUIREMENTS FOR CLASS 2 GASES IN BULK

Bulk Gases are subject to the *IMO Codes for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk*. Section 8 of AS 3846 provides some specific requirements for the handling of bulk liquefied gases and includes a ship/shore safety checklist. The handling of bulk gases generally requires a specific risk assessment to be undertaken to demonstrate that the design, location, and operation of the transfer facility will ensure the necessary levels of safety will be achieved. The export of bulk LPG at KBT and import/export of anhydrous ammonia at the KBJ has been approved for the producers, Wesfarmers LPG

and Wesfarmers CSBP respectively. Anhydrous ammonia risk assessment process has resulted in the development of a public exclusion plan for the area immediately surrounding KBJ.

SPECIAL REQUIREMENTS FOR DIVISION 2.3 TOXIC GASES

Specific risk assessments may be required to determine berth quantity limit for toxic gases and any specific engineering, operational and emergency controls that may be required to ensure safe import and export operations. Risk assessments have been conducted for the Inner Harbour to determine the quantities of toxic gases, such as chlorine and sulphur dioxide, that may be handled; also bulk anhydrous ammonia discharge operations through KBJ have been subjected to a detailed risk assessment. Any proposal to ship Class 2.3 toxic gases through the Port of Fremantle should be discussed with the Port Safety Advisor (Dangerous Goods).

5.3 CLASS 3 – FLAMMABLE LIQUIDS

Overview

Perhaps the most commonly encountered dangerous goods are Class 3 flammable liquids encompassing day-to-day products such as petrol, kerosene, paints, solvents and potable spirits (alcohol). Some flammable liquids are more hazardous than others due to differences in either the temperature at which ignition occurs or the energy required for ignition or the range of concentrations in air at which they are flammable. Combustible liquids are not Class 3s but are often grouped together because once ignited their behaviour is similar.

Table 6 shows the following:

- Flammable liquids - Flammable liquids give off a flammable vapour that will ignite at temperatures of 60°C or less (flash point).
- Combustible liquids - Combustible liquids will ignite and burn above 60°C (flash point). Combustible liquids are considered harder to ignite than flammable liquids, although once ignited they can contribute significantly to the fuel load.
- Packing Group - Each flammable liquid is assigned a Packing Group to indicate the relative level of hazard it presents. Designators PG I, PG II or PG III are used to describe the relative hazard of a material (i.e. high, medium and low danger) for determining the appropriate type of packaging and also to assist emergency responders in the case of incidents to ascertain the magnitude of the hazard.
- Flashpoint - Flashpoint is the lowest temperature at which a flammable liquid will release sufficient vapour for a flame to ignite under test conditions (closed-cup flash point test).

Table 6 Flammable and combustible liquids

Flammable and combustible liquids					
Type	Class/ Designator	Packing Group	Flashpoint	Initial boiling point	Examples
Flammable liquid	3	PG I	-	≤ 35°C	Diethyl-ether, petroleum-ethers, carbon disulphide
		PG II	< 23°C	> 35°C	Petrol (ULP), aviation fuel
		PG III	23 to 60°C	> 35°C	Mineral turpentine, kerosene
Combustible liquid	C1	n/a	>60 to 150°C	-	Diesel fuel, distillate
	C2	n/a	> 150°C	-	Brake fluid, waste oil

Quantity limits

The quantity limits applicable to all dangerous cargoes are summarised in **Table 3**.

Time limits

The time limits applicable to all containerised dangerous cargoes are summarised in **Table 4**.

Handling requirements

The general requirements applicable to handling of all dangerous cargoes are listed in **Section 2**.

Fire and emergency preparation

The minimum levels of firefighting equipment and response personnel required during the handling of dangerous goods are outlined in **Appendix A**.

Fremantle Ports provides firefighting resources for the Inner Harbour and the Kwinana Bulk Jetty during tanker operations. A firefighting vessel is also available.

SPECIAL REQUIREMENTS FOR CLASS 3 FLAMMABLE LIQUIDS IN BULK

Bulk flammable liquids are accommodated at both the Inner and Outer Harbours. The BP Oil Refinery Jetty is also located in the Outer Harbour.

Flammable liquids in bulk are subject to the *International Safety Guide for Oil Tankers and Terminals* (ISGOTT) – the ship/shore safety checklist is applicable. Section 8 of AS 3846 provides specific requirements for the handling of bulk flammable liquids.

Unless permitted by Fremantle Ports, a hazardous or restricted area will apply within 25 metres of any place where bulk flammable liquids are present, or any tank or space that has previously contained bulk flammable liquids (unless cleaned and certified gas free). Ignition sources, including mobile phones, must not be taken inside the restricted area (exclusion zone) around the vessel.

5.4 CLASS 4 – FLAMMABLE SOLIDS; SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION; SUBSTANCES WHICH ON CONTACT WITH WATER EMIT FLAMMABLE GASES

Overview

Class 4 substances in general are solid substances that will either burn readily in the presence of oxygen (sometimes without an ignition source) or will release a flammable substance when wet.

Class 4 encompasses three divisions:

- Division 4.1 - Flammable solids, self-reactive substances and solid desensitised explosives (i.e. solid substances that are easily ignited and readily combustible, such as sulphur, matches)
- Division 4.2 - Substances which in contact with air or water emit flammable gases (i.e. solid substances that ignite spontaneously, such as xanthates)
- Division 4.3 - Dangerous when wet (i.e. solid substances that emit a flammable gas when wet or react violently with water, such as calcium carbide, iron swarf).

Quantity limits

The quantity limits applicable to all dangerous cargoes are summarised in **Table 3**.

Note: There are no limitations on the quantities of containerised flammable solids that may be handled in the Port of Fremantle.

Time limits

The time limits applicable to all containerised dangerous cargoes are summarised in **Table 4**.

Handling requirements

The general requirements applicable to handling of all dangerous cargoes are listed in **Section 2**.

Fire and emergency preparation

The minimum levels of firefighting equipment and response personnel required during the handling of dangerous goods are outlined in **Appendix A**.

SPECIAL REQUIREMENTS FOR HANDLING DIVISION 4.1 FLAMMABLE SOLIDS IN BULK

Bulk solid dangerous cargoes are subject to the *IMO Code of Safe Practice for Solid Bulk Cargoes*. Section 9 of AS3846 provides some specific requirements for the handling of bulk solid cargoes. The Standard also includes a ship/shore safety checklist.

The handling of Class 4 flammable solids in bulk generally requires purpose-built facilities and specific consideration on a case-by-case basis. The Kwinana Bulk Jetty has purpose-built facilities for the handling of bulk sulphur. To discuss the handling of flammable solids substances in bulk, please contact the Port Safety Advisor (Dangerous Goods).

5.5 CLASS 5 – OXIDISING SUBSTANCES AND ORGANIC PEROXIDES

Overview

Class 5 oxidising substances and organic peroxides are reactive substances which are divided into two subdivisions:

Division 5.1 - Oxidising substances

Oxidising substances or articles, in certain circumstances, directly or indirectly evolve oxygen; therefore, when they come into contact with combustible materials, they may increase the risk and intensity of fire and may lead to explosion. Mixtures of oxidising substances with combustible material are readily ignited, in some cases by friction or impact. Some oxidising substances can spontaneously ignite and explode without the presence of an ignition source due to rapid decomposition. Certain oxidising substances may react to evolved toxic gases when mixed with other substances or when they are involved in a fire. Oxidising substances should be separated at all times from heat, contamination, combustible substances and flammable goods.

The oxidising substances ammonium nitrate and calcium hypochlorite present specific risks. Their ability to decompose rapidly giving off toxic fumes and to explode under extreme conditions requires particular attention.

- Ammonium nitrate (AN) is a major component of many commercial explosives and fertilisers. AN alone is not an explosive, however, when mixed with the appropriate substances or contaminants it forms an explosive. It can also demonstrate explosive properties under the combination of extreme conditions of temperature, pressure and impact.
- Calcium hypochlorite is a common household item for owners of swimming pools. It is the most commonly used form of solid pool chlorine and its hazard is often underestimated due to its familiarity. Calcium hypochlorite decomposes readily when contaminated, in contact with moisture or heated. Decomposition leads to the generation of toxic gases and heat and more rapid decomposition which can lead to explosion.

Division 5.2 - Organic peroxides

Organic peroxides (liquid or solid form) are thermally unstable substances which may undergo exothermic self-accelerating decomposition at normal or elevated temperatures. The decomposition can be initiated by heat, friction or impact, contact with impurities (such as acids, heavy-metal compounds or amines) and other substances. The rate of decomposition increases with temperature and varies with the organic peroxide formulation. Decomposition may result in the evolution of harmful, or flammable, gases or vapours. Some organic peroxides may decompose explosively, particularly if confined. Many organic peroxides burn vigorously. All organic peroxides for transport are assigned Packing Group II as they are required to be stabilised and/or temperature controlled in order to be stored, handled and transported safely. In addition, contact of organic peroxides with the eyes is to be avoided as some organic peroxides will cause serious injury to the cornea, even after brief contact, or will be corrosive to the skin. Examples of organic peroxides include methyl ethyl ketone peroxide (MEKP) and benzoyl peroxide.

Quantity limits

The quantity limits applicable to all dangerous cargoes are summarised in **Table 3**. The berth quantity limits specific to ammonium nitrate are outlined in **Table 7**.

Table 7 - Special berth quantity limits for Ammonium nitrate

Special Berth	Ammonium nitrate quantity limits
Inner Harbour (North Quay) Berths NQ1-12, CT1-4	750 tonnes
Outer Harbour (Kwinana Bulk Jetty) Berths KBB3-KBB4	10,000 tonnes
Note: <ul style="list-style-type: none">• The quantity limits for ammonium nitrate refer to the maximum quantity permitted to be on board a vessel at a berth and/or the maximum quantity that may be handled in respect of any one vessel and/or the maximum total quantity that may be kept within a terminal area.• The berth operator must ensure the quantities being handled at the berth do not exceed the specified berth quantity limits as well as the quantities listed on the applicable Dangerous Goods Site Licence and Special Berth declaration.	

Time limits

The time limits applicable to all containerised dangerous cargoes are summarised in **Table 4**.

Handling requirements

The general requirements applicable to handling of all dangerous cargoes are listed in **Section 2**. Ammonium nitrate and calcium hypochlorite require additional safety and security measures (See **Special requirements** below).

Non-explosive Explosion Risk Goods - The WA Dangerous Goods Safety (Storage and Handling of non-explosive Dangerous Goods) Regulations 2007 identify ten Division 5.1 substances as Explosion Risk Goods (ERG's) including Ammonium nitrate with UN numbers 1942, 2067, 2426, 3375 and Calcium hypochlorite with UN numbers 1748, 2208, 2880, 3485, 3486, 3487. (S&H Regulation 135B)

Security Sensitive Ammonium Nitrate - SSAN are chemicals that are of security concern. The WA Dangerous Goods Safety (Security sensitive ammonium nitrate) Regulations 2007 declare substances containing more than 45% ammonium nitrate to be Security Sensitive, unless it is an explosive or an aqueous solution as per Schedule 2. Security controls must be applied to all storage of SSAN and people handling SSAN have additional licensing and security responsibilities. Imports and exports require notification to the regulatory authority. Note: This definition includes dangerous goods with UN numbers 1942, 2067, 2068, 2069, 2070, 2071, 2072 and 3375 where applicable, as well as calcium ammonium nitrate which is not classified as dangerous goods. Explosives of Class 1 have been excluded from this definition as they are already regulated under the Explosives regulations.

Fire and emergency preparation

The minimum levels of firefighting equipment and response personnel required during the handling of dangerous goods are outlined in **Appendix A**.

Additional emergency requirements apply for ammonium nitrate (See **Special requirements** below).

SPECIAL REQUIREMENTS FOR HANDLING AMMONIUM NITRATE

Regulatory requirements for ammonium nitrate include:

- Quantities exceeding 30 tonnes of ammonium nitrate (AN) are considered Explosion Risk Goods and may only be loaded onto, or unloaded from, a vessel that is berthed at a special berth (non-explosives). (S&H Regulation 135H)

- Applications for a declaration of special berth (non-explosives) are made to the Department of Mines, Industry Regulation and Safety (DMIRS) and must be accompanied by (i) an aerial photo, (ii) a risk assessment addressing all related handling and transport operations demonstrating appropriate controls, (iii) an implementation plan, (iv) an Emergency Plan for berth agreed to by the Harbour Master and (v) a fee. (S&H Regulation 135I)
- Classification documentation (i.e. evidence of analysis, test certificate or approved alternative) must accompany each shipment of AN exceeding 30 tonnes entering the port area. Classification documentation must be provided to the berth operator before AN handling operations commence. (S&H Regulation 135M)
- When more than 30 tonnes of AN are handled at a berth, safety requirements include: the berth must be clean and clear of combustible dust and debris; there is to be no bunkering, no smoking, no hot work, no handling of incompatible cargo, traffic must be controlled, unauthorised people and vehicles are excluded from the berth, firefighting equipment and water hoses must be run out and ready for immediate use; the ship's engines shall be kept ready at all times so that the ship can leave at short notice; once loading has begun it shall be completed and the ship shall put to sea as soon as is practicable. (S&H Regulations 135N, 135O)
- Handling operations must be completed as soon as practicable after the vessel berths or the goods arrive on the berth. (S&H Regulations 135G2, 135O5)
- A vessel must not remain at the berth for any longer than is reasonably necessary to complete any handling of the goods. (S&H Regulations 135G3, 135O6)
- If there are any non-compliances with regulations, failures to comply with procedures or failure of controls specified in the special berth risk assessment, the berth operator must provide a written report to the chief officer within 14 days of the handling operation. (S&H Regulations 135P)

Fremantle Ports' requirements for handling ammonium nitrate include:

- The quantity limits for ammonium nitrate refer to the maximum quantity permitted to be on board a vessel at a berth and/or the maximum quantity that may be handled in respect of any one vessel and/or the maximum total quantity that may be kept within a terminal area.
- Handling requirements as per AS 3846 Clause 6.6 requirements for handling ammonium nitrate at a special berth apply.
- Only one vessel may unload or load AN at the special berth at a time.
- AN vessels must be berthed a minimum distance of 25 metres from boundaries and 25 metres from dedicated AN holding areas.
- To minimise the risks associated with AN, the time these goods are held in the port area should be minimised.
- **Holding areas:** When more than 400 tonnes of AN are kept within a container terminal, the containers must be placed or stacked in a dedicated location or holding area, located at a minimum distance of 25 metres from site boundaries and special berths, and 15 metres from protected works.
- **Container stacks:** Stacks are limited to eight containers, no more than two high and two deep with the stack accessible from all sides and segregated from other containers or stacks of AN a minimum distance of five metres and other dangerous goods by a minimum distance of three metres.

5.6 CLASS 6 – TOXIC AND INFECTIOUS SUBSTANCES

Overview

Toxic and infectious substances may be solid or liquid, they can cause harm through inhalation, ingestion or absorption, and they can vary significantly in respect to their degree of toxicity.

Class 6 encompasses two divisions:

- Division 6.1 - Toxic substances which are harmful to human health or liable to cause death or serious injury to human health if inhaled, swallowed or by skin absorption.
- Division 6.2 - Infectious substances - Category A: Infectious; and Category B: Samples of virus cultures, pathology specimens, used intravenous needles.

The use of Packing Groups plays a significant role for toxic substances in giving an immediate indication of the degree of harm presented by the material. Packing Group I toxic substances, such as sodium cyanide, are extremely toxic while Packing Group III toxic substances, such as many of the household pesticides/herbicides, present a much lower hazard.

Quantity limits

The quantity limits applicable to all dangerous cargoes are summarised in **Table 3**.

Note: There are no restrictions on the quantities of containerised Class 6 toxic and infectious substances that may be handled in the Port of Fremantle.

Time limits

The time limits applicable to all containerised dangerous cargoes are summarised in **Table 4**.

Handling requirements

The general requirements applicable to handling of all dangerous cargoes are listed in **Section 2**.

Fire and emergency preparation

The minimum levels of firefighting equipment and response personnel required during the handling of dangerous goods are outlined in **Appendix A**.

SPECIAL REQUIREMENTS FOR DIVISION 6.1 TOXIC SUBSTANCES IN BULK

The handling of toxic substances in bulk generally requires purpose-built facilities and specific consideration on a case-by-case basis.

Section 8 of AS 3846 provides requirements for bulk dangerous cargoes generally. Additional requirements are likely to apply to specific toxic cargoes according to the risk assessment.

- Bulk toxic substances that are liquid are subject to the requirements of the *IMO Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk*.
- Bulk toxic substances that are solid are subject to the *IMO Code of Safe Practice for Solid Bulk Cargoes*. Section 9 of AS 3846 provides some specific requirements for the handling of bulk solid cargoes. The Standard also includes a ship/shore safety checklist.

For the handling of Division 6.1 toxic substances in bulk, please contact the Port Safety Advisor (Dangerous Goods) for further information.

5.7 CLASS 7 – RADIOACTIVE SUBSTANCES

Overview

Class 7 dangerous goods spontaneously emit ionizing radiation. All radioactive materials are dangerous because they emit invisible radiation that may damage body tissue. This damage arises either from external irradiation or from internal irradiation following the intake of radioactive material into the body.

The degree of hazard presented by radioactive materials varies significantly, being a function of the type of material, its specific activity and the duration of exposure. Uranium oxide and monazite sands are commonly handled radioactive substances in Australia. The only radioactive substance regularly handled in Fremantle Port at present is tantalum glass classified as Low Specific Activity (LSA).

For packaging and transport requirements, this class is divided into three categories:

- Category I - almost no radiation - surface radiation does not exceed 5 $\mu\text{Sv/hr}$. (μSv = microsievert)
- Category II - low radiation levels - surface radiation does not exceed is more than 5 Sv/hr but does not exceed 500 $\mu\text{Sv/hr}$
- Category III - higher radiation levels or large quantity shipments (regardless of radiation level) - the surface radiation does not exceed is more than 500 $\mu\text{Sv/hr}$ but the maximum does not exceed 2000 $\mu\text{Sv/hr}$.

Requirements for the transport of radioactive substances are regulated by the States and Territories in conjunction with the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA). Details are contained in the *Code of Practice for the Safe Transport of Radioactive Substances*.

The *International Atomic Energy Agency (IAEA) Regulations for the Safe Transport of Radioactive Materials* specify requirements for packages and freight containers for radioactive substances; such substances are not permitted into the port area unless they conform to these requirements.

Compliance with the *IAEA Regulations for the Safe Transport of Radioactive Materials* and AS 3846 ensures that exposure from such LSA shipments remains so low that radiation monitoring of persons in the port area is not required.

Quantity limits

The quantity limits applicable to all dangerous cargoes are summarised in **Table 3**.

It is not possible to indicate specific quantity restrictions on containerised radioactive substances as this is dependent on the specific activity of the material and its method of packaging. These limits need to be determined on a case-by-case basis by reference to Section 7 of AS 3846.

Time limits

The time limits applicable to all containerised dangerous cargoes are summarised in **Table 4**.

Radioactive substances cannot remain for more than 24 hours within the Port of Fremantle. Further time limits may be applied depending on the specific activity of the material. If there is a requirement to store radioactive substances for longer than 24 hours, an individual berth operator may apply for registration with the Radiological Council of the Department of Health for their leased areas.

Handling requirements

The general requirements applicable to handling of all dangerous cargoes are listed in **Section 2**.

Additionally:

- All precautions must be taken to avoid unnecessary exposure of people to radioactive substances, e.g. people should be instructed to withdraw to a distance of five metres from any containers unless required for the handling operation.
- Cargo operations should be arranged so that people spend minimal time close to the radioactive substances.
- Lift trucks used to handle freight containers should use spreader bars or other means to prevent the possibility of tines puncturing the containers.
- In the event of any damage to a container or spillage of radioactive material, contact with or inhalation of the substances should be avoided. Appropriate expertise must be sourced immediately to deal with the incident regardless of how minor it may appear.

Fire and emergency preparation

The minimum levels of firefighting equipment and response personnel required during the handling of dangerous goods are outlined in **Appendix A**.

SPECIAL REQUIREMENTS FOR CLASS 7 RADIOACTIVE SUBSTANCES IN PACKAGES

The handling of any material in port areas with a specific activity greater than 70 kBq/kg handling is subject to the requirements of AS 3846 Section 7.

The ARPANSA *Code of Practice for the Safe Transport of Radioactive Material* should also be considered.

SPECIAL REQUIREMENTS FOR CLASS 7 RADIOACTIVE SUBSTANCES IN BULK

Specific requirements for the handling of bulk radioactive substances are required to be determined in conjunction with the State regulatory authority for radioactive materials (Radiological Council of the Department of Health).

5.8 CLASS 8 – CORROSIVE SUBSTANCES

Overview

Corrosive substances may be solid or liquid, acidic or caustic and mildly or extremely corrosive. They range from general household products through to industrial reagents.

The predominant impact of corrosives is on living tissue (organic material) and metals and they can dissolve organic tissue or severely corrode certain metals. In addition to a direct destructive action in contact with skin, eyes and mucous membranes, some substances in this class are toxic and poisoning may result if they are swallowed, or if their vapour is inhaled. Some of them may penetrate the skin. Many are sufficiently volatile to evolve harmful vapour; others are capable of producing toxic gases when decomposed by high temperatures.

The Packing Group gives an immediate indication of the degree of harm presented by the corrosive substances. Packing Group I corrosive substances are extremely corrosive (such as anhydrous hydrofluoric acid whereby small amounts absorbed through the skin can cause death) while Packing Group III corrosive substances, such as many of the concentrated household products, present a much lower hazard.

Quantity limits

The quantity limits applicable to all dangerous cargoes are summarised in **Table 3**.

Note: There are no restrictions on the quantities of Class 8 corrosive substances that may be handled in the Port of Fremantle.

Time limits

The time limits applicable to all containerised dangerous cargoes are summarised in **Table 4**.

Handling requirements

The general requirements applicable to handling of all dangerous cargoes are listed in **Section 2**.

Fire and emergency preparation

The minimum levels of firefighting equipment and response personnel required during the handling of dangerous goods are outlined in **Appendix A**.

SPECIAL REQUIREMENTS FOR CLASS 8 CORROSIVE SUBSTANCES IN BULK

Bulk corrosives are handled at the Kwinana Bulk Jetty and the Alcoa Jetty in the Outer Harbour.

Bulk corrosive substances that are solid are subject to the *IMO Code of Safe Practice for Solid Bulk Cargoes*.

Section 9 of AS3846 provides some specific requirements for the handling of bulk solid cargoes. The Standard also includes a ship/shore safety checklist.

Bulk corrosive substances that are liquid are subject to the requirements of the *IMO Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk*.

Section 8 of AS3846 provides requirements for bulk dangerous liquid cargoes generally.

5.9 CLASS 9 –MISCELLANEOUS DANGEROUS SUBSTANCES AND ARTICLES

Overview

Class 9 substances and articles are substances and articles which, during transport, present a danger not covered by other classes.

Class 9 includes:

- environmentally hazardous substances which are not covered by other classes, including liquid or solid substances pollutant to the aquatic environment and solutions and mixtures of such substances (such as preparations and wastes)
- elevated temperature substances (i.e. substances that are transported or offered for transport at temperatures equal to or exceeding 100°C in a liquid state or at temperatures equal to or exceeding 240°C in a solid state)
- genetically modified micro-organisms (GMMOs) and genetically modified organisms (GMOs) which do not meet the definition of infectious substances but which are assigned to UN 3245.

The Packing Group gives an immediate indication of the degree of harm presented by the substances. Packing Group I substances are extremely high hazard while Packing Group III substances present a much lower hazard.

Quantity limits

The quantity limits applicable to all dangerous cargoes are summarised in **Table 3**.

Note: There are no restrictions on the quantities of Class 9 substances that may be handled in the Port of Fremantle.

Time limits

The time limits applicable to all containerised dangerous cargoes are summarised in **Table 4**.

Handling requirements

The general requirements applicable to handling of all dangerous cargoes are listed in **Section 2**.

Fire and emergency preparation

The minimum levels of firefighting equipment and response personnel required during the handling of dangerous goods are outlined in **Appendix A**.

6. PIPELINES TRANSPORTING DANGEROUS GOODS WITHIN THE PORT AREA

Overview

There are pipelines within the port area involved in the transfer and carriage of gaseous and liquid dangerous cargoes. In addition to the risk of a spillage, pipelines carrying dangerous goods may present a greater safety risk (than combustible liquids and non-dangerous goods) due to the potential for fire and explosion associated with some classes of dangerous goods. Note that bunkering lines, used for the distribution of combustible liquids (high flashpoint liquids) are inherently safer.

Dangerous goods pipelines

Pipelines carrying dangerous goods across cadastral boundaries are required to be registered with the Department of Mines, Industry Regulation and Safety as per the Dangerous Goods Safety (Storage and Handling or Non-explosives) Regulations 2007.

These regulations set out the duties of the manufacturer, supplier or installer of a dangerous goods pipeline as well as duties of operator, supplier and owner of a dangerous goods pipeline. The regulations relate to:

- the quality, design, construction and use of dangerous goods pipelines
- the security, safety and safe operation of dangerous goods pipelines
- the labelling, marking and signposting pipelines
- insurance and indemnity
- registration of a dangerous goods pipeline.

Pipelines used for handling and transport of dangerous cargoes in port areas

Pipelines used for transfer of dangerous cargo within the port area are subject to the requirements of AS 3846 in relation to the operation of loading or unloading of a ship, transfer to, from or within a terminal area or transshipment between ships or other modes of transport.

Additional requirements may include any requirements applied by the port authority (e.g. conditions of licence, lease agreement or access agreement).

Relevant sections of AS 3846 are:

- Section 2 - General requirements that apply to activities involving dangerous goods in a port area
- Section 8 - Selected clauses relating to bulk liquid dangerous cargoes including liquefied gases
- Appendix O -The construction, installation, testing, maintenance and operation of pipeline.

Relevant pipeline standards:

- AS 1345: Identification of the contents of pipes, conduits and ducts
- AS 1697 - 2005: Installation and maintenance of steel pipe systems for gas
- AS 2832.1: Cathodic protection of metals - Pipes and cables
- AS 2885 Series: Pipelines - Gas and liquid petroleum - Provides guidance on design, construct and maintenance of dangerous goods pipeline
- AS 4041: Pressure piping - Provides guidance on design, construct and maintenance of piping subject to internal or external pressure
- AS 4977-2008: Petroleum products - Pipeline, road tanker compartment and underground tank identification
- AS/NZS 4853: Electrical hazards on metallic pipelines
- HB 105 -1998: Guide to pipeline risk assessment in accordance with AS 2885.1
- HB 76: Dangerous Goods - Initial Emergency Response Guide.

Extracts from AS 3846 - Requirements applicable to pipelines used for handling and transport of dangerous cargoes in port areas

Section/Clause	Requirements
8.2.1	Prior to bulk liquid dangerous cargoes, including liquefied gases, being handled, the applicable cargo handling controls, gauging systems, and emergency shutdown and alarm systems shall be tested or inspected, and found to be satisfactory. Where any of the controls or systems are found to be unsatisfactory, cargo handling operations shall not commence unless the permission of the designated port officer has been obtained.
8.2.2.4	The berth operator shall provide the Master with a written statement of the integrity of pipelines, loading arms, hoses and other equipment. Appendix J provides an example of a shore declaration - Shore facility integrity Statement.
8.2.2.7	All items that are within the responsibility of the ship shall be checked by the ship's representative, and all items that are within the responsibility of the berth operator shall be checked by the berth operator's representative. A ship/shore safety check list, complying with that given in Appendix L, shall be completed. The standards of safety on both sides of the operation shall be fully acceptable to both representatives. A representative of the port authority, the regulatory authority, or both, may audit the agreed safety arrangements in the safety check list from time to time.
8.2.12.1	Where pipelines are to be used, the conditions set out in Clause (8.2) shall be met. <ul style="list-style-type: none"> • Throughout the pumping operation, responsible persons shall attend the valves on the berth and ship. In the event of any incident, such persons shall stop the pumps and close the valves. • Any incident such as spillage, fire or injury, or the potential for spillage, fire or injury, shall be immediately attended to and reported in accordance with the emergency plan. • Operations shall be discontinued if required by the regulatory authority. • Any pipeline shall be constructed, installed and maintained in accordance with Appendix O; used only for substances with which it is compatible; provided with an adequate spillage containment system at the seaward end of the berth; protected from impact damage; and regularly inspected along its full length, so that any leakage is detected. • Where heated or cooled products are carried, any devices intended to warn against too high or too low a temperature being reached, shall be regularly inspected. • The build-up of static electricity in bulk flammable liquids shall be controlled.
8.2.12.2	Upon the completion of every bulk transfer of liquid dangerous cargoes: <ul style="list-style-type: none"> • The valves of the discharging and receiving space and tanks shall be closed and any residual pressure in the relevant piping released. • All safety precautions shall be taken, including blanking off the ship manifold connection and shore pipeline. • When a pipeline is disconnected, the seaward end shall be closed liquid-tight. • On completion of pumping, the pipeline, loading arm or flexible hose shall be drained free of any liquid dangerous cargoes.
8.5.4	All shore pipelines shall be cleared of liquid after the cargo transfer.
Appendix O	The construction, installation, testing, maintenance and operation of pipelines, shall comply with appropriate standards as well as the additional requirements.

- Construction, installation, testing, maintenance and operation of pipelines shall comply with - AS/NZS 1596, AS 1697, AS/NZS 2022, AS 2117, AS or AS/NZS 2885 series, BS 1435.2, BS EN 1765, AIP CP26 – as appropriate.
- If required, proposals for any major repairs to pipelines, alterations to the layout, or the installation of new pipelines and pipework systems, shall be submitted to the relevant authority and consent shall be obtained before work commences
- Following each periodic test and inspection of pipelines, as required by the appropriate standard, a certificate shall be forwarded by the berth operator to the regulatory authority upon request, stating - (i) details and results of the tests and measurements taken; and (ii) whether the inspection was a visual or other examination.
- Pipelines, flexible hose and fittings shall be inspected on every occasion before use.
- Valves and other appliances used for pumping operations shall be inspected and checked to ensure proper operation on each occasion before pumping commences. NOTE: The port authority may, by giving written notice to the berth operator, require the berth operator to relocate, renew or repair pipelines and fittings.
- The insulating system required to ensure electrical discontinuity between the ship and shore shall be tested at least annually. The berth operator shall provide a record of these tests to the port authority upon request.
- The seaward end of pipelines and all other openings in pipelines on wharves shall be provided with a recognized means of closure.
- Pipelines on wharves shall be fitted with a non-return valve and stop-valve at the outer or seaward end, where the distance between the end of the wharf pipeline and the shore tank is greater than 200 metres. Where required by the port authority, a non-return valve at the shore end of the wharf shall also be placed in the pipeline to prevent backflow.
- Positive shut-off valves that clearly indicate whether the valve is open or closed shall be used at all pipeline shut-off points.
- Where automatic control valves are fitted, stop push-buttons shall be provided within 30 m of the seaward end of the pipeline and at points well-removed from the pipeline, in order to stop the pumps and close the valves in an emergency at loading berths and to close valves in an emergency at discharge berths.

APPENDIX A

Table 8 Fremantle Ports' fire and emergency resources, response personnel and objectives for dangerous cargo types Class or Division

Class/ Division	Minimum fire equipment	Minimum personnel	Objectives
1 (excludes less than 10 tonnes of Division 1.4 and transit cargo)	<ul style="list-style-type: none"> • Fire equipment to provide a flow rate of at least 600L/min • Sufficient foam concentrate and foam equipment for initial attack of a fire at the loading / unloading area • Ship's equipment laid out and ready on board vessel <p>Example - Fire hose and branch off hydrant @ 600L/min and foam fire extinguishers</p>	2 x Port Services Officers (may include Port Services Patrol Officer)	<ul style="list-style-type: none"> • Minimise the risk of fire on the wharf • Ensure safe handling and immediate removal of cargo from the port area • Ensure appropriate actions undertaken in the event of an emergency
2.1 (Containers)	N/A	1x Port Services Patrol Officer	<ul style="list-style-type: none"> • Ensure general safety precautions • Ensure removal from wharf in 12 hours • Ensure appropriate actions undertaken in the event of an emergency
2.2 (Containers)	N/A	1x Port Services Patrol Officer	<ul style="list-style-type: none"> • Ensure general safety precautions observed • Ensure appropriate actions undertaken in the event of an emergency
2.3 (Containers)	N/A	1x Port Services Patrol Officer	<ul style="list-style-type: none"> • Ensure general and any product specific safety precautions observed • Ensure removal from wharf in 12 hours • Ensure appropriate actions undertaken in the event of an emergency
2.1 (Bulk LPG)	<ul style="list-style-type: none"> • Shore-based firefighting equipment meeting the minimum required flow rate of Appendix G of AS3846. 	2 x Port Service Officers	<ul style="list-style-type: none"> • Ensure general safety precautions observed • Ensure restricted area, security and control of ignition sources maintained • Audit ship/shore safety checklist when required • Initial emergency response aims to contain and stop spread of fire
2.3 (Bulk anhydrous ammonia)	<ul style="list-style-type: none"> • 1 x Thune Eureka • 1 x Foam Trailer with hoses • Apollo Ground Monitor off Hydrants • 2 x international couplings (male & 	3 x Port Services Officers (Security personnel are the responsibility of the Berth Operator)	<ul style="list-style-type: none"> • Ensure general safety procedures observed • Ensure restricted area, security and control of ignition sources maintained • Audit ship/shore safety checklist when required • Minimise risk of fire on wharf equipment

	female) with gaskets, nuts & bolts.		<ul style="list-style-type: none"> Initial activation of water spray in an emergency to knockdown vapour and reduce spread of toxic gas cloud Assist with evacuation in case of emergency
Class 3 (Containers, includes transit)	N/A	1x Port Services Patrol Officer	<ul style="list-style-type: none"> Ensure general safety precautions observed Ensure removal from wharf in 12 hours where necessary Ensure appropriate actions undertaken in the event of an emergency
3 (Bulk, includes transit)	<ul style="list-style-type: none"> Equipment flow rate and foam concentrate specified in AS 3846 as 'Initial Attack Resources' 	2/3 x Port Services Officers (Manning until ship sails unless tanker has inert gas system and all product discharged)	<ul style="list-style-type: none"> Minimise the risk of fire on the wharf or ship Contain any spillage and extinguish any fire Ensure appropriate actions undertaken in the event of an emergency
(Bulk at BP Oil Refinery Jetty)	Refer to BP Oil Refinery	(Personnel are the responsibility of the Berth Operator)	<ul style="list-style-type: none"> Minimise the risk of fire on the wharf or ship Contain any spillage and extinguish any fire Ensure appropriate actions undertaken in the event of an emergency
4 (Containers and bulk *)	N/A	1x Port Services Patrol Officer	<ul style="list-style-type: none"> Ensure general safety precautions are observed Ensure removal from wharf in 12 hours where applicable Ensure appropriate actions undertaken in the event of an emergency
5 (Containers)	N/A	1x Port Services Patrol Officer	<ul style="list-style-type: none"> Ensure general safety precautions observed Ensure removal from wharf in 12 hours where necessary Ensure appropriate actions undertaken in the event of an emergency
5 (Bulk)	<ul style="list-style-type: none"> Based on risk assessment and determined on a case-by-case basis 		
5 (Ordinary berth for ammonium nitrate and calcium hypochlorite)	N/A	1x Port Services Patrol Officer	<ul style="list-style-type: none"> Ensure general safety precautions observed Ensure no fire risk or sources of ignition Ensure appropriate actions undertaken in the event of an emergency
5 (Special berth for ammonium nitrate)	<ul style="list-style-type: none"> Fire equipment to provide a flow rate of at least 1200L/min Sufficient foam concentrate and foam equipment for initial 	2 x Port Services Officers (not including Port Service Patrol Officer)	<ul style="list-style-type: none"> To control a fire in the vicinity of the loading / unloading area on the wharf and minimise the risk of escalation Ensure no fire risk or sources of ignition Ensure appropriate actions undertaken in the event of an emergency

	<p>attack of a fire at the loading/unloading area</p> <ul style="list-style-type: none"> • Ship's equipment laid out and ready on board the vessel <p>Example - A foam and pump trailer @ 1800L/min OR Thune Eureka and foam trailers @ 1476L/min</p>		
6.1 (Containers and bulk *)	N/A	1x Port Services Patrol Officer	<ul style="list-style-type: none"> • Ensure general safety precautions observed • Ensure removal from wharf in 12 hours where applicable • Ensure appropriate actions undertaken in the event of an emergency
7 (Containers)	N/A	1x Port Services Patrol Officer	<ul style="list-style-type: none"> • Ensure general safety precautions observed • Ensure compliance with time limits and storage in port area • Ensure appropriate actions undertaken in the event of an emergency
8 (Containers and bulk *)	N/A	1x Port Services Patrol Officer	<ul style="list-style-type: none"> • Ensure general safety precautions observed • Ensure removal from wharf in 12 hours where applicable • Ensure appropriate actions undertaken in the event of an emergency
<p>*See detailed requirements by cargo type in Section 5.</p>			



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