

Australian Standard™

**The handling and transport of
dangerous cargoes in port areas**



This Australian Standard was prepared by Committee ME-081, Storage, Handling and Transport of Dangerous Cargoes in Port Areas. It was approved on behalf of the Council of Standards Australia on 10 October 2005.
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Association of Australian Port & Marine Authorities
Australasian Fire Authorities Council
Australasian Railway Association
Australian Chamber of Commerce and Industry
Australian Institute of Petroleum
Australian Maritime Safety Authority
Australian Shipowners Association
Department of Consumer and Employment Protection, W.A.
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Australian Standard™

The handling and transport of dangerous cargoes in port areas

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PREFACE

This Standard was prepared by Standards Australia Committee ME-081, Storage, Handling and Transport of Dangerous Cargoes in Port Areas, to supersede AS 3846—1998. Its requirements are based on, and are intended to complement, the International Maritime Organization (IMO) *Recommendations on the Safe Transport of Dangerous Cargoes and Related Activities in Port Areas*.

The Standard has been revised to meet changed regulatory requirements and to update procedures in line with current practices.

The purpose of this Standard is to provide safety requirements and recommendations for facilities and operations at ports where dangerous cargoes are handled.

In this Standard, the term ‘dangerous cargoes’ is defined as any cargo, including fuel, stores or other commodities, whether packaged or in bulk, intended for carriage by sea and having properties that are within the Classes listed in the IMO *International Maritime Dangerous Goods Code* (IMDG Code).

This definition also includes any bulk cargo which is not covered by the *IMDG Code*, but which is subject to the requirements of the IMO Code for the *Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk*, the IMO Code for the *Construction and Equipment of Ships Carrying Liquefied Gases in Bulk*, the IMO Code of Existing Ships Carrying Liquefied Gases in Bulk, or Appendix B of the IMO Code of Safe Practice for Solid Bulk Cargoes, insofar as such a cargo could constitute a hazard to those in the port area or to the port environment.

It is recognized that there are solid substances shipped in bulk which do not constitute any hazard when stored ashore, but which may create problems affecting safety subsequent to their loading onto a ship. In such situations compliance with the provisions of the IMO Code of Safe Practice for Solid Bulk Cargoes (*BC Code*) is necessary.

Permission to use the Ship/Shore Safety Check list from the fourth edition of the *International Safety Guide for Oil Tankers and Terminals* (ISGOTT) is gratefully acknowledged.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of an appendix. A normative Appendix is an integral part of a Standard, whereas an informative Appendix provides information and guidance only.

Statements expressed in mandatory terms in notes to tables are deemed to be requirements of this Standard.

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STANDARDS AUSTRALIA

Australian Standard

The handling and transport of dangerous cargoes in port areas

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard sets out requirements and recommendations for the safe entry, presence, handling and transport of dangerous cargoes, as listed in the *International Maritime Dangerous Goods Code* (IMDG Code) and defined in Clause 1.4.20, within port areas.

NOTE: The term ‘dangerous cargo’ is synonymous with ‘dangerous goods’ which is used in the *UN Recommendations for the Transport of Dangerous Goods—Model Regulations*.

The purpose of this Standard is to provide minimum acceptable safety requirements for the handling and transport of dangerous goods at port facilities, including operating procedures, repair work, emergency planning and fire protection. It provides technical guidance that may assist in the handling and transport of dangerous cargoes in port areas in accordance with regulatory requirements. However, practices alternative to those set out in this Standard may be employed, provided that an appropriate level of safety, based on a documented risk assessment, can be maintained and demonstrated. Advice should be sought from the relevant regulatory authority.

1.2 APPLICATION

This Standard applies to the handling and transport of dangerous cargoes (as defined in Clause 1.4.20) in port areas. The requirements of this Standard apply in conjunction with, but do not take precedence over, any regulatory requirements that apply.

This Standard does not apply to the following operations:

- (a) Bunkering, unless deemed to apply by the relevant port authority.
- (b) The handling and transport of coal.

For the purposes of this Standard, coal is not considered a dangerous cargo.

1.3 REFERENCED DOCUMENTS

A list of documents referred to in this Standard is provided in Appendix A.

1.4 DEFINITIONS AND ABBREVIATIONS

For the purpose of this Standard, the definitions, abbreviations and acronyms given below apply.

NOTE: The abbreviation ‘(IMO)’ at the end of a definition indicates that it has been drawn from the *IMO Recommendations on the Safe Transport of Dangerous Cargoes and Related Activities in Port Areas*.

1.4.1 ADG Code

The *Australian Dangerous Goods Code*, published by the Commonwealth Department of Transport and Regional Services.

NOTE: The current edition of the *ADG Code* should be consulted.

1.4.2 Administration

The government of the country whose flag the ship is entitled to fly.

1.4.3 Air draught

The vertical distance of a reference point on a ship measured from the waterline, e.g. the height above the water to the top of the mast, for passing under bridges, or the height above the water of the top of a hatch coaming, for access under a loader/unloader.

1.4.4 Alcohol type concentrate (ATC)

A foam concentrate designed to extinguish alcohol and other polar solvent fires.

1.4.5 AMSA

Australian Maritime Safety Authority.

1.4.6 Aqueous film forming foam (AFFF)

A synthetic foam concentrate designed to extinguish flammable liquid fires.

1.4.7 BC Code

The *IMO Code of Safe Practice for Solid Bulk Cargoes*.

1.4.8 Berth

Any dock, pier, jetty, quay, wharf, marine terminal or similar structure (whether floating or not) at which a ship may tie up. It includes any plant or premises, other than a ship, used for purposes ancillary or incidental to the loading or unloading of dangerous cargoes (IMO).

1.4.9 Berth operator

Any person or body of persons who has, for the time being, the day-to-day control of the operation of a berth (IMO).

1.4.10 Bulk

Cargoes that are intended to be carried without any intermediate form of containment, in a cargo space that is a structural part of a ship, or in a tank permanently fixed in or on a ship (IMO).

NOTES:

- 1 For land transport, the definition of the term 'bulk' as given in the *ADG Code* applies and varies significantly from that given here.
- 2 Other internationally-used definitions of the term 'bulk' are given in the *IMO Code of Safe Practice for Solid Bulk Cargoes* (BC Code) and the *IMDG Code*.

1.4.11 Bulk containers

Containment systems (including any liner or coating) intended for the transport of solid substances which are in direct contact with the containment system. Packagings, intermediate bulk containers (IBCs), large packagings and portable tanks are not included.

Bulk containers—

- (a) are of a permanent character and accordingly strong enough to be suitable for repeated use;
- (b) are specially designed to facilitate the transport of goods by one or more means of transport without intermediate reloading;
- (c) are fitted with devices permitting ready handling; and
- (d) have capacity of not less than 1 cubic metre.

Examples of bulk containers are freight containers, offshore bulk containers, skips, bulk bins, swap bodies, trough-shaped containers, roller containers, and load compartments of vehicles (IMO).

1.4.12 Certificate of fitness

A certificate issued by, or on behalf of an Administration, in accordance with the relevant codes for the construction and equipment of a type of ship, certifying that the construction and equipment of the ship are such that certain specified dangerous cargoes may be carried in that ship (IMO).

1.4.13 Certificate of test (test certificate)

For the purpose of this Standard, the term is synonymous with the term 'written authority' used in AS/NZS 2865.

1.4.14 Chemical tanker

A ship constructed or adapted and used for the carriage in bulk of any liquid product listed in Chapter 17 of the *IMO Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk*, as amended from time to time.

1.4.15 Cold work

Any work not classified as hot work and that is outside normal operating procedures.

1.4.16 Combination carrier

A ship designed to carry either oils or solid cargoes in bulk.

NOTE: These vessels are sometimes referred to as OBO (Oil/Bulk/Ore) carriers.

1.4.17 Compatible

In relation to a substance, the container in which it is kept, the equipment with which it is handled, or other substances with which it might come into contact, the ability to tolerate each other without—

- (a) increasing the hazard of an individual substance;
- (b) causing deterioration or contamination;
- (c) increasing the potential to cause a fire, explosion or violent reaction, including the potential hazard in the event of fire;
- (d) evolving of flammable or toxic gas; or
- (e) otherwise leading to the injury of persons or danger to property.

1.4.18 Competent person

A person who has successfully completed documented training that encompasses all of the atmospheric monitoring recommendations given in AS/NZS 2865 within the previous two years, and who has written authority from his employer to conduct such monitoring.

NOTE: This definition does not exclude a self-employed person.

1.4.19 Correct technical name

Synonymous with the 'proper shipping name' as defined in the *International Maritime Dangerous Goods Code* (IMDG Code) (see also Clause 1.4.72).

1.4.20 Dangerous cargoes

Any of the following cargoes, whether packaged, or in bulk containers, or in bulk, and within the scope of the following:

- (a) Oils, covered by Annex I of MARPOL 73/78.

- (b) Gases, covered by the *Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk*.
- (c) Noxious liquid substances or chemicals, including wastes, covered by the *Codes for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk* and Annex II of MARPOL 73/78.
- (d) 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).
- (e) 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.

NOTE: In assessing the hazard posed by the cargoes referred to in Items (a) to (e) above, the volatility, toxicity and pollution category of the cargo should be considered.

1.4.21 Dangerous goods

Substances and articles that—

- (a) satisfy the UN tests and criteria for determining whether they are dangerous goods; or
- (b) are listed in the *ADG Code*; or
- (c) are determined to be dangerous goods by the competent authority.

NOTE: UN tests and criteria are given in the *UN Manual of Tests and Criteria* and the *UN Recommendations on the Transport of Dangerous Goods—Model Regulations*.

1.4.22 Deck scupper

An opening in the side of a ship, at or just below the level of the deck, to allow water to run off.

1.4.23 Designated port officer

A person appointed by the regulatory authority for designated duties or any person having authority so to act.

1.4.24 EDIFACT

Electronic Data Interchange for Administration, Commerce and Transport.

1.4.25 Entry permit

A form, issued by a competent person, that identifies hazards and protective measures to be considered when entering a confined space. For the purpose of this Standard, the term 'entry permit' is synonymous with the term 'certificate of test'.

1.4.26 Firefighting support ship (FFS Ship)

A Class A or B ship.

NOTE: The classification of firefighting support ships and the requirements for their equipment are given in Appendix B.

1.4.27 Firewall

A wall or other barrier having a specified fire resistance level, constructed and placed for the purpose of preventing the spread of fire.

1.4.28 Flammable

Capable of being ignited and of burning.

1.4.29 Flammable gases

Gases which at 20°C and a standard pressure of 101.3 kPa either—

- (a) ignite when in a mixture of 13% or less by volume with air; or
- (b) have a flammable range with air of at least 12 percentage points, regardless of the lower flammable limit.

1.4.30 Flammable liquids

Liquids, or mixtures of liquids or liquids containing solids in solution or suspension (for example, paints, varnishes, lacquers, etc. but not including substances otherwise classified on account of their dangerous characteristics) that give off a flammable vapour at temperatures of not more than 60.5°C, closed-cup test, or not more than 65.6°C, open-cup test, normally referred to as the flash point.

NOTE: Further information on the flash point of flammable liquids is given in the *ADG Code*.

1.4.31 Flash point

The lowest temperature, corrected to a barometric pressure of 101.3 kPa, at which application of a test flame causes the vapour of the test portion to ignite under the specified conditions of test.

NOTE: Closed-cup flash point test methods are given in the AS 2106 series.

1.4.32 Flexible hose

Any flexible hose complying with AS/NZS 1869, BS 1435.2, BS EN 1765, AS 2117, or equivalent national standard.

1.4.33 Foam (firefighting foam)

A stable aggregation of small bubbles, of lower density than oil or water, whose properties are such that the foam may be used as a flame-smothering blanket, or to prevent the entry of air, or to suppress vapour.

NOTES:

- 1 Foams are defined by their expansion rate and are divided into three expansion ranges:
 - (a) Low-expansion foam—expansion up to 10.
 - (b) Medium-expansion foam—expansion from 20 to 200.
 - (c) High-expansion foam—expansion from 200 to approximately 1000.
- 2 Foam is made by mixing air into a solution of water and foam concentrate, by means of suitably designed equipment. Such foam flows freely over the burning surface and forms an air-excluding, continuous blanket that seals volatile vapours from contact with air. It can resist disruption from wind, drafts, heat or flame and is capable of resealing in case of mechanical rupture. Firefighting foams retain these properties for relatively long periods of time.

1.4.34 Foam concentrate

A concentrated liquid foaming agent, as received from the manufacturer.

1.4.35 Foam solution

A homogeneous mixture of water and foam concentrate, in the proportions specified by the manufacturer.

1.4.36 Freight container

An article of transport equipment that is—

- (a) of a permanent character and accordingly strong enough to be suitable for repeated use;
- (b) specially designed to facilitate the carriage of goods, by one or more modes of transport, without intermediate reloading;
- (c) fitted with devices permitting its ready handling, particularly its transfer from one mode of transport to another; and
- (d) so designed as to be easy to fill and empty, and has an internal volume 1 m³ or more.

The term 'freight container' does not include a vehicle, a conventional packaging or an intermediate bulk container (IBC).

1.4.37 Gangway

A safe means of access between ship and shore, or between ship and ship, complying with the provisions of AMSA *Marine Orders Part 21*.

1.4.38 Gas

The term 'gas' includes gas, vapour, fumes, mist or smoke.

1.4.39 Gas-free

A tank or space that has been thoroughly cleaned and ventilated in accordance with the requirements of AS/NZS 2865 or an international specification, and has been tested and certified by a competent person (as defined in Clause 1.4.18).

1.4.40 Gas carrier (tanker)

A ship constructed or adapted and used for the carriage in bulk of any liquefied gas or other products listed in Chapter 19 of the IMO *Code for Construction and Equipment of Ships Carrying Liquefied Gases in Bulk*.

1.4.41 Handling

The operation of loading or unloading of a ship, railway wagon, vehicle, freight container or other means of transport, transfer to, from or within a warehouse or terminal area or within a ship or transshipment between ships or other modes of transport and includes intermediate keeping, i.e. the temporary storage of dangerous cargoes in the port area during their transport from the point of origin to their destination for the purpose of changing the modes or means of transport (IMO).

1.4.42 Harmful

Any substance from which danger arises from breathing its vapour or gas, or which is dangerous when taken through the mouth or absorbed through the skin, or causes harm to the skin or respiratory organs, or is an asphyxiant.

1.4.43 Hazardous area

An area or space in which an explosive or flammable atmosphere is present, or may be expected to be present, in quantities such as to require special precautions for the construction, installation and use of potential ignition sources.

NOTE: A classification system for hazardous areas is given in the AS/NZS 2430 series of Standards.

1.4.44 Hot work

The use of open fires and flames, power tools, hot rivets, grinding, soldering, burning, cutting, welding or any other work involving heat or creating sparks which may lead to a hazard because of the presence or proximity of dangerous cargoes (IMO).

1.4.45 Ignition source

A source of energy sufficient to ignite a flammable atmosphere. Examples of ignition sources include, but are not limited to, naked flames, incendive sparks, exposed incandescent material, electrical welding arcs and mechanical or electrical equipment (e.g. mobile phones, laptop computers) not suitable for use in a hazardous area.

1.4.46 IMDG Code

The *International Maritime Dangerous Goods Code*, published by the International Maritime Organization.

1.4.47 IMO

The International Maritime Organization.

1.4.48 Inerted

In relation to a tank or space, having sufficient nitrogen or other non-flammable gas introduced in order to maintain the oxygen content of the atmosphere at or below 8% by volume, or below 50% of the minimum concentration necessary for combustion, whichever is the lesser.

1.4.49 Intermediate bulk container (IBC)

A rigid or flexible portable packaging for the transport of dangerous goods, as defined in the *IMDG Code*.

1.4.50 ISGOTT

The *International Safety Guide for Oil Tankers and Terminals*, published by the International Chamber of Shipping.

1.4.51 Liquefied gas

A gas that has been liquefied by pressure or by cooling, and including both liquid and gaseous phases.

1.4.52 Loading arm

An articulated hard pipe system and its associated equipment, which may include quick release couplings, emergency release systems or hydraulic power pack, used for the purpose of transferring dangerous cargoes (IMO).

1.4.53 Low Specific Activity (LSA) material

Radioactive material which by its nature has a limited specific activity, or radioactive material for which limits of estimated average specific activity apply.

LSA material is divided into three groups:

- (a) LSA-I;
- (b) LSA-II; and
- (c) LSA-III.

These groups are further defined and explained in the UN *Recommendations for the Transport of Dangerous Goods—Model Regulations*.

1.4.54 Marine orders

Subordinate legislation issued by AMSA pursuant to Section 425 (1AA) of the *Navigation Act 1912*, as amended from time to time.

1.4.55 MARPOL (MARPOL 73/78)

The *International Convention for the Prevention of Pollution from Ships*.

1.4.56 Master

A person having command or charge of a ship.

1.4.57 Material safety data sheet (MSDS)

A document which provides information on the identification, health hazards, precautions for use and safe handling of a specific chemical product.

NOTE: Australian MSDS should comply with NOHSC:2011.

1.4.58 May

Indicates the existence of an option.

1.4.59 Multipurpose carrier

A ship designed to carry either liquid or solid cargoes, or both, in bulk or packaged form, and including a combination carrier.

1.4.60 Net explosive quantity (NEQ)

The mass of explosive material contained in an explosive.

1.4.61 NLS

Noxious liquid substance (as listed in Annex II of MARPOL 73/78).

1.4.62 Oil tanker

A ship constructed or adapted primarily to carry oil in bulk in its cargo spaces, including combination carriers and any chemical tanker (as defined in the current MARPOL Convention) when it is carrying a cargo or part cargo of oil in bulk.

1.4.63 Ordinary berth

A berth where ships with general cargo operate, and which is not nominated as a special berth.

1.4.64 Package

The complete product of the packing operation, consisting of the packaging and its contents prepared for transport.

1.4.65 Packing

The packing, loading or filling of dangerous cargoes into receptacles, intermediate bulk containers (IBCs), freight containers, tank containers, portable tanks, railway wagons, bulk containers, vehicles, shipborne barges or other cargo transport units (IMO).

1.4.66 Packing Group (PG)

One of the three hazard groups to which dangerous goods (excluding Classes 1, 2, 6.2 and 7) are assigned in the *IMDG Code*, in decreasing order of hazard, by the Roman numerals 'I' (high danger), 'II' (medium danger) and 'III' (low danger).

NOTE: The UN *Recommendations on the Transport of Dangerous Goods—Model Regulations* provide criteria for the assignment of packing groups. Lists of those already assigned are given in the *ADG Code* and *IMDG Code*.

1.4.67 Pipeline

All pipes, connections, valves and other ancillary plant, apparatus and appliances in a port that are provided or used for, or in connection with, the handling of dangerous cargoes, but does not include a flexible pipe, loading arm or any part of a ship's pipes, apparatus or equipment other than the termination of those parts of the ship's pipes apparatus or equipment to which a flexible pipe is connected (IMO).

1.4.68 Port area

The land and sea area established by legislation (IMO).

NOTE: Some port areas may overlap and requirements should take account of this possibility.

1.4.69 Port authority

Any person or body of persons empowered to exercise effective control in a port area.

1.4.70 Portable tank

A tank not permanently secured to the ship, having a capacity of at least 350 L, and used for the transport of liquids, and including tank vehicles.

1.4.71 Practicable

Practicable with regard to—

- (a) the severity of the hazard or risk in question;
- (b) the state of knowledge about that hazard or risk and any ways of removing or mitigating that hazard or risk;
- (c) the availability and suitability of ways to remove or mitigate that hazard or risk; and
- (d) the cost of removing or mitigating that hazard or risk.

1.4.72 Proper shipping name

The name used to describe a dangerous good, as defined in the *IMDG Code* (see also Clause 1.4.19).

1.4.73 Protected places

Any of the following:

- (a) A dwelling, place of worship, public building, school or college, hospital, theatre or any building or open area in which persons are accustomed to assemble, whether within or outside the port area.
- (b) A factory, workshop, office, store, warehouse, shop, or building where people are employed that is outside the boundary of the site where the dangerous cargoes are handled.
- (c) A vessel lying at permanent berthing facilities.
- (d) Any storage facility for dangerous cargoes that is outside the property boundary of the port area, except those defined as minor storages in other Standards or regulations.

1.4.74 QRA

Quantitative risk assessment.

NOTE: An outline of quantitative risk assessment is given in Appendix C.

1.4.75 Regulatory authority

Any national, regional or local authority empowered by legislation to make, enforce or administer requirements in respect of a port area.

NOTE: The regulatory authority may include, but is not limited to, the port authority, the dangerous goods regulatory authority, the chief inspector of explosives, or emergency services authority. More than one authority may be involved.

1.4.76 Response time (on-site)

The time elapsed between the notification of an incident and resources and personnel being at the scene of the incident, in a position to take appropriate action.

1.4.77 Responsible person

A person appointed by a shore side employer or the master of a ship, empowered to take all decisions relating to his specific task, having the necessary current knowledge and experience for that purpose and, where required, is suitably certificated or otherwise recognized by the regulatory authority (IMO).

1.4.78 Restricted area

An area to which access is limited to specific or authorized persons, usually under specified conditions.

1.4.79 Safe area

An area in which all necessary precautions are taken to ensure that there can be no ingress of flammable or toxic gas or vapour. Such an area may comprise one of the following:

- (a) An enclosed space on a ship, designated a safe area by the master, and permitted as such by the designated port officer (as defined in Clause 1.4.23).
- (b) An enclosed structure on the berth, designated a safe area by the berth operator, and permitted as such by the designated port officer.
- (c) An area within a restricted area, in which the designated port officer has given permission for essential work to be undertaken, subject to any special precautions or conditions.

1.4.80 Safety management system

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 (see also Section 2).

1.4.81 Shall

Indicates that a statement is mandatory.

1.4.82 Ship

Any sea-going or non-sea-going water craft, including those used on inland waters, used for the transport of dangerous cargoes (IMO).

1.4.83 Should

Indicates a recommendation.

1.4.84 Skilled person

Any person having the current knowledge, experience and competence to perform a certain duty (IMO).

1.4.85 SOLAS

The *International Convention for the Safety of Life at Sea*.

1.4.86 Span gas

A calibration gas appropriate for the measuring instrument and the gas whose concentration is to be measured.

1.4.87 Special berth

A berth sufficiently separated, controlled and specifically designated for handling dangerous cargoes.

1.4.88 Subsidiary risk (subrisk)

A reference to any additional hazard that the dangerous goods might have, as indicated by the Subsidiary Risk number to which the dangerous goods are assigned. Dangerous goods are assigned a Subsidiary Risk if they—

- (a) satisfy the criteria specified in the UN *Manual of Tests and Criteria* for their assignment to a Subsidiary Risk;
- (b) are assigned a Subsidiary Risk in the *IMDG Code* or *ADG Code*; or
- (c) are assigned a Subsidiary Risk by the regulatory authority.

1.4.89 Surface contaminated object (SCO)

A solid object that is not itself radioactive but that has radioactive material distributed on its surfaces.

SCO is classified into one of two groups:

- (a) SCO-I; and
- (b) SCO-II.

These groups are further described in the UN *Recommendations for the Transport of Dangerous Goods—Model Regulations*.

1.4.90 Tanker

A ship constructed or adapted for the carriage of liquid hydrocarbons (oil), gas or chemicals in bulk.

1.4.91 Tanker berth

A place where a tanker that is not gas-free may be berthed, including the area within 25 m of the tanker.

1.4.92 Transport

The movement by one or more modes of transport within the port area (IMO).

1.4.93 Transport Index (TI)

In relation to Class 7 (radioactive) dangerous goods, a single number assigned to a package, overpack, tank or freight container, or to unpackaged LSA-1 or SCO-1 material, which is used to provide control over both nuclear criticality safety and radiation exposure.

NOTE: The *IMDG Code* provides a method of determining the Transport Index.

1.4.94 Wire gauze

A metal gauze made of a suitable material having a melting point of at least 900°C, and being either a single gauze not less than 140 mesh/cm², or a double gauze not less than 62 mesh/cm², spaced between 25 and 30 mm apart.

SECTION 2 GENERAL REQUIREMENTS

2.1 SCOPE OF SECTION

This Section provides general requirements and recommendations that apply to any activity performed in a port area, and are additional to those given for other specific operations within this Standard.

2.2 RISK ASSESSMENT, REQUIREMENTS AND PRECAUTIONS

Where the requirements of this Standard need to be varied, a documented risk assessment shall be undertaken. Such an assessment shall take into account the hazards and risks of any dangerous cargo that is to be handled at a port or remaining on board a ship at a berth.

Where the maximum quantity of a dangerous cargo is not specified in this Standard, a risk assessment, as described above, should be undertaken.

The risk assessment shall emphasize the prevention or minimization of hazardous incidents on site (e.g. fire, explosion and the release of toxic chemicals, that could result in adverse off-site effects).

A safety management system should be prepared and put in place. Such a system should provide a management framework for safely undertaking potentially hazardous activities, minimizing the likelihood of incidents, managing occupational health and safety, and assisting in the protection of people, property and the environment.

NOTES:

- 1 Guidance on risk assessment to determine the suitability of alternative safety practices and dangerous cargo limitations is provided in AS/NZS 4360 and Appendix C of this Standard.
- 2 Rapid ranking techniques are given in *Multi-level Risk Assessment*, published by Planning NSW and based on the *Manual for the classification and prioritisation of risks due to major accidents in the process and related industries*, published by the IAEA (1993).
- 3 A list of documents providing guidance for the development of a safety management system is given in Appendix D.
- 4 The regulatory authority may vary the restrictions and precautions applying to a berth (including separation distances) if prevailing factors or conditions indicate that those given in this Standard are inappropriate. Such factors and conditions may include the frequency of occurrence, the presence of potential ignition sources, the chemical and physical nature of the cargo, the potential for spillage, the topography and demography of the area, and the prevailing weather conditions.

An emergency plan should also be prepared, in order to combat any incidents and emergencies that might occur.

NOTE: Appendix D provides guidance on emergency planning.

2.3 GENERAL REQUIREMENTS FOR DOCUMENTATION, MARKING AND PACKAGING OF DANGEROUS CARGOES

The following requirements apply:

- (a) All dangerous cargoes delivered to or from the port area shall be packed, marked, labelled and placarded in accordance with the *IMDG Code*.
- (b) Where the dangerous cargoes are in packages and are to be loaded onto a ship at an Australian port, their packagings shall comply with the *IMDG Code*.

- (c) Documentation for dangerous cargoes within the port shall comply with the *IMDG Code*.

NOTE: For road and rail transport of dangerous cargoes to or from port areas, compliance with the *ADG Code* is mandatory.

2.4 GENERAL REQUIREMENTS FOR PORTS, BERTHS AND SHIPS

2.4.1 Road traffic management

Procedures and signs shall be in place to ensure that road traffic operates in a safe manner.

2.4.2 Security of port areas

All port areas shall be appropriately secured at all times against unauthorized access.

NOTE: Port security requirements apply.

2.4.3 Training

Appropriate training shall be provided, so that skilled personnel are employed in handling dangerous cargoes. Records of training shall be kept.

Competency assessments or refresher training for berth operations personnel shall be conducted at least every three years.

NOTES:

- 1 The berth operator normally provides such training.
- 2 The *AIP Guide for Training Shore Officers* provides guidance for training personnel in the handling of bulk liquid cargoes.
- 3 Chapter 1.3 of the *IMDG Code* provides guidance for training personnel in the handling of packaged dangerous goods.

2.4.4 Trained personnel in attendance

Dangerous cargoes should only be handled by persons skilled in handling such cargoes, and by persons being trained (and who are supervised by a trained person).

2.4.5 Personal protective equipment

Whenever dangerous cargoes are being handled, appropriate personal protective equipment shall be readily available in accordance with regulatory requirements and used when necessary.

2.4.6 Entry into a confined space

Activities requiring entry into a confined space on ships or shore installations by persons other than the ship's crew shall comply with AS/NZS 2865.

On board a ship, compliance by crew members with the IMO MSC/Circ. 744, *Recommendations for Entering Enclosed Spaces Aboard Ships*, shall be considered to satisfy this requirement.

NOTE: This document is reproduced in Appendix E.

2.4.7 Safety showers

Whenever a toxic, corrosive or skin sensitising substance is handled in bulk, a safety shower and eyewash facilities (both using fresh water) shall be provided and kept ready for use. Such equipment may be of a portable type.

NOTE: ANSI Z358.1 provides performance requirements for such equipment.

2.4.8 Repair work and fire precautions

Repairs involving hot work shall be carried out in accordance with AS 1674.1, AS 1674.2 and Section 11 of this Standard.

2.4.9 Inspections and audits

The regulatory authority, port authority or berth operator shall be granted access to a ship or berth at any time, to conduct inspections and audits.

2.4.10 Precautions against smoking

Smoking shall only be allowed in areas declared safe by the master, berth operator or relevant regulatory authority. Such safe areas shall be clearly demarcated and identified, e.g. by **SMOKING PERMITTED** signs.

2.4.11 Communication

When dangerous cargoes are being handled, a continual means of communication shall be established and maintained between the ship and the berth operator.

Communications, instructions and safety signs need to be able to be understood by all personnel involved.

SECTION 3 ADVANCE NOTIFICATION

3.1 SCOPE OF SECTION

This Section sets out requirements for advance notification to be given prior to dangerous cargoes being brought in to the port area by either land or sea.

3.2 ADVANCE NOTIFICATION

Advance notification shall be provided to the port authority at least 24 h before a dangerous cargo is brought into the waters of a port area or onto the berth. This requirement shall apply to dangerous cargoes that are to be unloaded or loaded and those to be left on board. Such notification shall include the information set out in Clauses 3.3 and 3.4, as appropriate.

NOTES:

- 1 The regulatory authority may also require advance notification.
- 2 A properly completed standard EDIFACT dangerous cargo message satisfies these requirements.

3.3 PACKAGED DANGEROUS CARGOES

The following information shall be provided in the advance notification:

- (a) Name and Lloyds/IMO number of ship.
- (b) Estimated date and time of arrival (ETA) of ship, or delivery of goods to port area, as appropriate.
- (c) Name of agent, contact name and telephone number.
- (d) If containerized, container identification number.
- (e) Number and type of packages.
- (f) Proper shipping name/correct technical name.
- (g) *IMDG Code* classification and any subsidiary risk classification.
- (h) UN number (where applicable).
- (i) Packing Group (where applicable).
- (j) Flash point (where applicable).
- (k) Quantity.
- (l) The condition of the dangerous cargo, if any abnormal hazard is likely to arise.
- (m) Any known defect that may adversely affect the safety of the port area, the ship or the environment.
- (n) In the case of Classes 1, 4.1, 5.2, 6.2 or 7, additional information as specified in Chapter 5.4 of the *IMDG Code*.

3.4 BULK DANGEROUS CARGOES

The following information shall be provided in the advance notification:

- (a) Name and Lloyds/IMO number of ship.
- (b) Estimated date and time of arrival (ETA) of ship, or delivery of goods to port area, as appropriate.

- (c) Name of agent, contact name and telephone number.
- (d) Proper shipping name/correct technical name.
- (e) UN number (where applicable).
- (f) *IMDG Code* classification and any subsidiary risk, with Packing Group or MARPOL NLS category and flash point, as appropriate.
- (g) Quantity of cargoes to be unloaded/loaded and those to be left on board.
- (h) For solid bulk dangerous cargoes, a certificate of manufacture.
- (i) For liquids and liquefied gases, whether the ship holds the following valid certificates, as appropriate:
 - (i) International Oil Pollution Prevention Certificate.
 - (ii) International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk.
 - (iii) Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk.
 - (iv) International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk.
 - (v) Certificate of Fitness (Gas Carrier Code)
 - (vi) International Certificate of Fitness for the Carriage of Liquefied Gases in Bulk.
 - (vii) Cargo inhibitor certificate (where applicable).
- (j) The condition of the dangerous cargo and any known defect in the cargo containment, handling system, equipment or instrumentation that is related to the bulk cargo and that could lead to an abnormal hazard.
- (k) Any known defect that could adversely affect the safety of the port area, the ship or the environment.

SECTION 4 DANGEROUS CARGOES OF EXPLOSIVES OF CLASS 1

4.1 SCOPE OF SECTION

This Section sets out requirements for dangerous cargoes of Class 1 (i.e. explosives of Class 1) in port areas. It should be read in conjunction with the requirements of the regulatory authority.

4.2 COMPATIBILITY AND MIXED STOWAGE

Dangerous cargoes of Class 1 are considered to be compatible if they can be safely stowed or carried together without significantly increasing either the probability of an accident or, for a given quantity, the magnitude of the effects of such an accident. By this criterion, goods listed in this Class have been divided into a number of compatibility groups, each denoted by a letter from A to L (excluding I), N and S.

NOTES:

- 1 Classification codes and compatibility groups are given in Appendix F.
- 2 Further explanations are given in *IMDG Code*.

Explosives shall be segregated in accordance with the requirements of Table 4.1 of this Standard and the *IMDG Code*.

Explosives of compatibility group L shall not be handled in a port area unless—

- (a) specifically permitted by the port authority and the regulatory authority; and
- (b) any special precautions have been taken.

4.3 GENERAL REQUIREMENTS

4.3.1 Handling and transport

The following requirements apply to the handling and transport of explosives in port areas:

- (a) Explosives (excluding Division 1.4) shall not be brought to a berth for loading onto a ship unless the ship is ready to receive them.
- (b) Explosives (excluding Division 1.4) shall 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.
- (c) Explosives of Divisions other than 1.4 shall be taken directly to or from a ship, and not be held on a berth for more than two hours.
- (d) Explosives shall be handled in a safe, efficient and secure manner.
- (e) Explosives shall not be handled unless they have been classified in accordance with the *IMDG Code*.
- (f) The handling of explosives, once commenced, shall proceed without delay or interruption, except in the circumstances given in Clause 4.3.6.
- (g) The area of the berth where explosives are being handled, and a space of at least 15 m beyond the immediate handling area, shall be secured and clearly demarcated. Non-essential personnel shall be excluded.
- (h) The spaces within the ship or vehicle in which the explosives are to be loaded shall be carefully cleaned, and kept in a clean and safe condition.

- (i) If emulsion precursors are handled on the same vessel, or in the same area as explosives, Note 4 of Table 4.2 shall apply.
- (j) Only packages that are in good condition shall be received into the handling area. If, in the course of handling explosives, any package, or the seal of any package of explosives appears to be damaged, the regulatory authority shall be advised and the package set aside for examination and repair or safe disposal.
- (k) If any explosives are spilled or leak from a package, the spillage shall be secured. Appropriate specialist advice to address the spill shall be obtained and the regulatory authority shall be notified.
- (l) On completion of loading, the loaded ship or vehicle shall depart from the port area as soon as is reasonably practicable.
- (m) Commonwealth Explosives shall be handled in accordance with the Commonwealth Explosives Act.
- (n) Explosives shall be unloaded as soon as reasonably practicable.
- (o) Smoking shall be strictly prohibited on the ship and on the berth, except in safe areas (see also Clause 2.4.10). Notices shall be prominently displayed on the ship and on the berth bearing the words **DANGER—NO SMOKING—NO NAKED LIGHTS**.
- (p) Repairs involving hot work shall be prohibited on the ship or on the berth whilst explosives (excluding Division 1.4S) are being transported or handled.
NOTE: This requirement may be varied by the port authority, e.g. when emergency repairs are necessary.
- (q) Prior to and during the handling of explosives, adequate and appropriate firefighting facilities and adequate supplies of water shall be immediately available at the berth and in the berth area.

4.3.2 Deteriorated explosives

If any explosives are suspected to have deteriorated or undergone any change in condition that could increase the hazards involved in handling or transporting them, special conditions shall apply. Such conditions shall be agreed upon (in writing) between the regulatory authority and the person who is authorized to be in possession of the explosives.

4.3.3 Traffic management

The following requirements apply:

- (a) Road traffic movement shall comply with Clause 2.4.1.
- (b) Road vehicles carrying explosives of other than Division 1.4 shall be at least 100 m apart while waiting to load a ship.
- (c) Rail vehicles shall be separated in accordance with the *Australian Explosives Code*.

4.3.4 Lift trucks

Where lift trucks are used to handle explosives of Divisions other than 1.4S, they shall be—

- (a) electrically-, LP Gas-, or diesel-powered;
- (b) fitted with spark arresters where appropriate;
- (c) inspected prior to use, to ensure that they are free from leaks; and
- (d) attended at all times while in a cargo compartment or storage area.

4.3.5 Customer's representative

When more than 100 kg NEQ of explosives (of other than Division 1.4) is loaded or unloaded in a port area, a shipper's or consignee's representative shall 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.

4.3.6 Electrical storms

The loading or unloading of explosives shall be suspended during electrical storms. Such operations shall not be resumed until the storm has passed.

All personnel should be removed from the loading or unloading area until after the electrical storm has passed.

NOTE: AS 1768 provides further information about lightning protection.

4.3.7 Emergency procedures

Emergency procedures, developed in conjunction with the port authority and the emergency services, shall be in place before any explosives are handled.

NOTE: Consideration should be given to not fighting fires involving explosives of Class 1, due to the risk to emergency responders.

TABLE 4.1
PERMITTED MIXED STOWAGE FOR DANGEROUS GOODS OF CLASS 1

Compatibility group	A	B	C	D	E	F	G	H	J	K	L	N	S
A	X												
B		X											X
C			X	X	X		X1					X4	X
D			X	X	X		X1					X4	X
E			X	X	X		X1					X4	X
F						X							X
G			X1	X1	X1		X					X1	X
H								X					X
J									X				X
K										X			X
L											X2		
N			X4	X4	X4		X1					X3	X
S		X	X	X	X	X	X	X	X	X		X	X

‘X’ Indicates that goods of corresponding compatibility groups may be stowed in the same compartment, portable magazine, freight container or vehicle.

‘X1’ Indicates that articles in compatibility group G (other than fireworks and those requiring special stowage) may be stowed with articles of compatibility groups C, D, E and N, provided that no explosive substances are carried in the same compartment, portable magazine, freight container or vehicle.

‘X2’ Indicates that a consignment of one type in compatibility group L should only be stowed with a consignment of the same type within compatibility group L.

‘X3’ Indicates that different types of articles of Division 1.6, compatibility N, may only be transported together when it is proven that there is no additional risk of sympathetic detonation between the articles. Otherwise they should be treated as Division 1.1.

‘X4’ Indicates that, when articles of compatibility group N are transported with articles or substances of compatibility groups C, D or E, the goods of compatibility group N should be treated as though they were of compatibility group D.

4.4 REQUIREMENTS RELATING TO THE SHIP

4.4.1 Requirements when the ship is at a berth

The following requirements shall apply whenever there are explosives on board the ship, while the ship is at a berth, whether or not any cargo is being handled:

- The ship's engines and ancillary equipment shall be kept ready at all times, so that the ship can leave the berth at short notice.
NOTE: This requirement does not apply to explosives of Division 1.4.
- The ship shall be berthed in a direction that allows the quickest departure from the berth in an emergency, unless directed otherwise.
- Explosives shall be segregated from incompatible cargoes, combustibles and other dangerous cargoes at all times.

- (d) Lighting and other electrical cables and equipment shall be physically protected and kept well clear of the explosives. This requirement does not apply to electric forklift trucks and other essential electrical equipment.

4.4.2 Additional requirements when handling explosives

The following requirements apply when handling explosives. They are additional to those in Clause 4.4.1.

- (a) Bunkering shall not take place whilst explosives are being loaded or unloaded, unless permitted by the port authority.
- (b) Except when explosives of Division 1.4 are handled, adequate and appropriate firefighting equipment and water shall be immediately available on the ship. Fire hoses shall be run out and ready for immediate use.

4.5 ORDINARY BERTHS

The following requirements shall apply to the quantity of explosives on board a ship as cargo remaining on board, or that can be handled at an ordinary berth.

NOTE: These requirements apply in conjunction with those of the regulatory authority.

- (a) The maximum quantity (NEQ) of explosives that can be handled at an ordinary berth shall be as given in Table 4.2.
- (b) Explosives of Division 1.1, 1.2, 1.3 or 1.4 shall be separated from protected places and accommodation quarters on other ships in accordance with Table 4.2.

NOTE: The separation distances to main roads, main railways and other berths may be half the distance given in Table 4.2.

- (c) Explosives of Division 1.4S shall not be restricted in terms of the quantity allowed on board a ship, or handled at an ordinary berth.
- (d) Explosives of Division 1.5 shall be treated as Division 1.1.
- (e) Explosives of Division 1.6 shall be separated from protected places and public places in accordance with Table 4.2, the distance being determined from the net explosive quantity (NEQ) of a single article.
- (f) Subject to Items (b) and (c) above, where explosives of different Divisions are on board a ship or are to be handled, the limit on quantities shall apply as if all the explosives were of the most restrictive Division.
- (g) Quantities exceeding those permitted in Table 4.2 shall only be handled following the setting of the necessary criteria by the regulatory authority.

NOTE: Any ship that has on board, or intends to handle, any quantity of explosives may be required by the regulatory authority to occupy a special berth.

4.6 SPECIAL BERTHS

4.6.1 General

Quantities of explosives exceeding the NEQ limits of Table 4.2 may be handled at a special berth, subject to risk assessment and the instigation of a safety management system.

NOTE: The consent of the regulatory authority may be required.

4.6.2 Selection of a special berth

The following items shall be considered when selecting a special berth:

- (a) The total quantity, type and class of explosives to be transported or handled.
- (b) The method of packaging, containment and stowage of the explosives.

- (c) The total quantity, type and classification of other dangerous cargo on the ship.
- (d) The geography of the port and the location of the special berth within the port area.
- (e) The proximity to protected places, other ships, other berths, main roads and main railways.
- (f) The materials of construction of the special berth.
- (g) The need to declare a temporary safety distance and a restricted area around the ship and the special berth.
- (h) Any need to temporarily relocate persons whilst explosives are removed from the special berth.
- (i) The type and availability of transport for the immediate removal of explosives from the special berth.
- (j) The immediate availability of adequate firefighting resources at the special berth.
- (k) Any need to restrict operations to daylight hours.
- (l) Re-routing of land or waterborne traffic.
- (m) Prohibiting the entry of unauthorized persons into the restricted area.
- (n) Proximity to tanks and pipelines.
- (o) Separation from hazardous facilities.
- (p) The need for the ship to have unrestricted passage to open water or other safe area.

NOTE: An ordinary berth, which is sufficiently isolated and controlled, may be declared a 'special berth' for a specific period of time. This may be by introducing additional requirements or modifying the existing requirements. The port authority or regulatory authority would normally make such a declaration.

TABLE 4.2
SEPARATION DISTANCES FROM ORDINARY BERTHS TO
PROTECTED PLACES

Net explosive quantity (NEQ) of explosives kg	Separation distances, m			
	Division			
	1.1, 1.5, 1.6 (See Note 2)	1.2	1.3	1.4
25	10	50	10	10
50	25	50	10	10
100	33	50	10	10
200	52	52	10	10
300	68	68	10	10
400	82	82	10	10
500	95	95	10	10
1 000	150	150	10	10
1 500	191	191	10	10
2 000	240	210	10	10
2 500	257	220	87	10
3 000	284	225	92	10
4 000	350	235	105	10
5 000	380	245	110	10
7 500	424	265	125	10
10 000	480	280	140	10
15 000	546	300	158	10
20 000	610	320	175	10
25 000	650		186	10
30 000	689	340	199	10
40 000	762	360	218	10
50 000	820	375	240	20
75 000	940	400	273	20
100 000	1 040	410	300	20
150 000	1 180	410	345	20
200 000	1 300	410	375	20
250 000	1 400	410	405	20

NOTES:

- 1 The separation distance for intermediate quantities of explosives may be obtained by linear interpolation from the two adjacent values.
- 2 For one type of article of Division 1.6, the total NEQ is that of one article. Where different types of articles of Division 1.6 are involved, the total NEQ of all articles should be used.
- 3 NEQ is referred to as NEM in *the IMDG Code*.
- 4 If dangerous cargoes of Class 1 (except 1.4S) are to be handled simultaneously with emulsion precursors, then the total quantity of these materials shall be considered as Class 1 and the relevant separation distances shall apply.
- 5 Where ammonium nitrate is to be handled simultaneously with explosives of Divisions 1.1, 1.5 or 1.6, and within the separation distances given in this Table, then 50% of the quantity of ammonium nitrate shall be added to the explosives quantity to obtain the resultant NEQ, and the relevant separation distance shall apply.

SECTION 5 PACKAGED DANGEROUS CARGOES OF CLASSES 2, 3, 4, 5, 6, 8 OR 9

5.1 SCOPE OF SECTION

This Section sets out requirements for packaged dangerous cargoes of dangerous goods Classes 2, 3, 4, 5, 6, 8 or 9 in port areas.

NOTE: Additional requirements for ammonium nitrate (except for UN 2071) and calcium hypochlorite are given in Section 6.

5.2 GENERAL REQUIREMENTS

5.2.1 Maximum quantities delivered to and removed from a berth within 12 hours

Where quantities greater than 500 kg of any of the dangerous goods listed in Table 5.1 are brought onto a berth—

- (a) they shall be delivered to the berth within 12 h of their being loaded onto a vessel; and
- (b) they shall be removed from the berth within 12 h of being unloaded from a vessel.

The above requirements do not apply if the dangerous goods are kept in a restricted area as described in Clause 5.3.

TABLE 5.1
DANGEROUS CARGOES TO BE DELIVERED TO AND
REMOVED FROM A BERTH WITHIN 12 HOURS

Class	Packing Group	Description
2.1	—	Flammable gases
2.3	—	Toxic gases
3	PG I	Flammable liquids
4.1	PG I	Flammable solids and desensitized explosives
4.2	PG I	Substances liable to spontaneous combustion
4.3	PG I	Substances which, in contact with water, emit flammable gases
5.1	PG I	Oxidizing substances
6.1	PG I	Toxic substances
8	PG I	Corrosive substances

NOTE: 'PG' indicates Packing Group.

5.2.2 Other dangerous goods delivered to and removed from a berth within 5 days

Dangerous goods addressed by this Section (excluding those covered by Clauses 5.2.1, 5.2.3, 5.2.4 and 5.2.5) shall be—

- (a) removed from the berth within five days of unloading from the ship; or
- (b) delivered onto the berth no more than five days before loading onto a ship.

This requirement does not apply to containers under fumigation (UN 3359).

Subject to a satisfactory risk assessment, this time may be extended if written authorization, including any conditions to be observed, has been received from the regulatory authority. Such conditions shall be met.

5.2.3 Class 5.1 PG I dangerous cargoes

Quantities of Class 5.1 PG I dangerous cargoes exceeding 400 t shall only be handled on a berth with the consent of the regulatory authority.

5.2.4 Class 5.2 material having a Class 1 subsidiary risk

Organic peroxides of Class 5.2 that have a Class 1 (explosive) subsidiary risk shall be handled in the same manner as explosives of Division 1.1 (see Section 4).

5.2.5 Dangerous cargoes of Class 6.2

The receipt and handling of dangerous cargoes of Class 6.2 (infectious substances) shall be subject to agreement with the authorities responsible for the safety of the port.

5.3 RESTRICTED AREAS

Subject to a satisfactory risk assessment (as described in Clause 2.2), and in conjunction with the regulatory authority, a restricted area may be designated on the berth. Dangerous cargoes listed in Table 5.1 may be kept within the restricted area for up to five days.

When evaluating the suitability of a site for a restricted area, the following features shall be considered:

- (a) The nature and quantities of hazardous materials kept on the site and dangerous cargoes to be kept in the area.
- (b) The type of equipment to be used in handling the cargo.
- (c) The adequacy of the berth operator's technical, operational, organizational and emergency safeguards.
- (d) Surrounding land uses, population densities and proximity to other hazardous installations.
- (e) The interaction of the abovementioned factors.

A transport unit containing dangerous cargoes as listed in Table 5.1 may be kept within a restricted area if written authorization, including any conditions to be observed, has been received from the port authority.

5.4 SEGREGATION

5.4.1 Maritime transport

Dangerous cargoes in port areas shall be segregated in accordance with Table 5.2 and the requirements of Chapter 7.2 of the *IMDG Code*, as given below:

- (a) For packages, IBCs, flat racks, platforms or open-top containers:
 - 0 = no segregation is necessary unless required by individual schedules.
 - A = away from, i.e. separated by at least 3 m.
 - S = separated by—
 - in open areas, at least 6 m;
 - in sheds and warehouses, at least 12 m or an acceptable firewall.

(b) For closed containers, portable tanks, or closed road vehicles:

0 = no segregation necessary.

A = away from; no separation necessary.

S = separated by—
in open areas, at least 3 m;
in sheds and warehouses, at least 6 m or an acceptable firewall.

NOTES:

- 1 Table 5.2 uses '0' to indicate that no general segregation is required, but that individual schedules of the *IMDG Code* need be consulted. The *IMDG Code*'s general segregation table uses 'X' instead of the '0' used in Table 5.2. The difference is intentional, to emphasize the difference in the use of the segregation tables.
- 2 A 'closed container' or 'closed road vehicle' means a unit in which dangerous goods are totally enclosed by sufficiently strong boundaries, e.g. a freight container, a tank or a vehicle. The term does not include containers or vehicles with fabric-covered sides or tops.
- 3 Further guidance may be obtained from the *IMDG Code* and the *IMO Recommendations on the Safe Transport of Dangerous Cargoes and Related Activities in Port Areas*.

TABLE 5.2
SEGREGATION OF DANGEROUS CARGOES

Description	Class	Segregation code											
		Class											
		2.1	2.2	2.3	3	4.1	4.2	4.3	5.1	5.2	6.1	8	9
Flammable gases	2.1	0	0	0	S	A	S	0	S	S	0	A	0
Non-toxic, non-flammable gases	2.2	0	0	0	A	0	A	0	0	A	0	0	0
Toxic gases	2.3	0	0	0	S	0	S	0	0	S	0	0	0
Flammable liquids	3	S	A	S	0	0	S	A	S	S	0	0	0
Flammable solids	4.1	A	0	0	0	0	A	0	A	S	0	A	0
Spontaneously combustible substances	4.2	S	A	S	S	A	0	A	S	S	A	A	0
Substances which are dangerous when wet	4.3	0	0	0	A	0	A	0	S	S	0	A	0
Oxidizing substances	5.1	S	0	0	S	A	S	S	0	S	A	S	0
Organic peroxides	5.2	S	A	S	S	S	S	S	S	0	A	S	0
Toxic substances	6.1	0	0	0	0	0	A	0	A	A	0	0	0
Corrosives substances	8	A	0	0	0	A	A	A	S	S	0	0	0
Miscellaneous dangerous substances and articles	9	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: The legend for this Table is explained in Clause 5.4.1.

5.4.2 Road and rail transport

Where dangerous cargoes are being transported into port areas, or dangerous cargoes in port areas are loaded for transport by road or rail, the segregation requirements given in the *ADG Code* apply.

SECTION 6 ADDITIONAL REQUIREMENTS FOR AMMONIUM NITRATE AND CALCIUM HYPOCHLORITE

6.1 SCOPE OF SECTION

This Section sets out requirements and recommendations for dangerous cargoes of ammonium nitrate and calcium hypochlorite. These are additional to those in Sections 2, 3 and 5.

6.2 CLASSIFICATION OF AMMONIUM NITRATE AND CALCIUM HYPOCHLORITE

In this Section, the term ‘ammonium nitrate’ refers to the types of ammonium nitrate and ammonium nitrate based fertilizer listed as Class 5.1 in the *IMDG Code* (e.g. UN 1942, 2067, 2426 and 3375).

The term ‘calcium hypochlorite’ refers to the forms of calcium hypochlorite listed as Class 5.1 in the *IMDG Code* (e.g. UN 1748 and 2880).

NOTE: The requirements of Section 5 apply to ammonium nitrate of UN 2071.

6.3 FUNDAMENTAL SAFETY

6.3.1 General

The key to the safe handling and transport of ammonium nitrate and calcium hypochlorite is the avoidance of fire or contamination. Risks of such dangers from external sources (including collisions, fires and contamination) should be positively addressed and minimized.

Decomposing ammonium nitrate and calcium hypochlorite release harmful gases in a fire, which can affect some individuals. This needs to be considered when determining a special berth (see also Clause 6.5).

6.3.2 Ammonium nitrate

Ammonium nitrate is a supporter of combustion. A fire aboard a ship carrying ammonium nitrate could involve the risk of explosion in the event of confinement or contamination (e.g. by fuel oil). An adjacent explosion could also lead to an ammonium nitrate explosion. Ammonium nitrate decomposes when heated strongly, giving off harmful gases that support combustion.

Ammonium nitrate should be isolated from all sources of excessive heat. Cleanliness and separation from potential contaminants, combustible materials, other dangerous goods, oils and other fuels is necessary.

6.3.3 Calcium hypochlorite

Calcium hypochlorite decomposes slowly at room temperature, releasing small amounts of chlorine from its reaction with atmospheric moisture. When in contact with small amounts of water, heat is generated which can lead to thermal decomposition. Contact with any organic material or quaternary ammonium compounds can cause an explosive fire.

Calcium hypochlorite should be protected from all sources of heat. Even in the absence of other combustible materials, after initiation (critical ignition temperature 75°C), local rapid thermal decomposition can spread throughout the contained mass as a vigorous fire that gives off, rather than consumes, oxygen. Thermal decomposition can be explosive, with the evolution of oxygen, chlorine and dichlorine monoxide.

6.4 QUANTITY LIMITS AT ORDINARY BERTHS

Where ammonium nitrate or calcium hypochlorite is to be handled at an ordinary berth, the aggregate quantity handled at any one time shall not exceed that given in Table 6.1.

An additional quantity not exceeding 1000 t may be conveyed on the ship as through cargo (i.e. cargo remaining on board) at an ordinary berth. Such quantities shall be packed in freight containers, flexible bulk containers or other packaging, or packed in bulk in a freight container. Any special requirements specified by the port authority shall be complied with.

NOTE: The port authority may require that any cargo space in which such ammonium nitrate or calcium hypochlorite is stowed remains closed while the ship is at the berth.

TABLE 6.1
MAXIMUM QUANTITIES OF AMMONIUM NITRATE OR CALCIUM
HYPOCHLORITE TO BE HANDLED AT AN ORDINARY BERTH

Substances	Maximum aggregate quantity t
Ammonium nitrate (UN 1942, 2426, 3375), ammonium nitrate based fertilizers (UN 2067), and calcium hypochlorite (UN 1748 and 2880) contained in—	
(a) freight containers	400
(b) other packaging (including loose IBCs)	150
Emulsion precursors (explosives ingredients)	Consult regulatory authority

NOTES:

- 1 Ammonium nitrate of UN 0222 is a Class 1 explosive. Section 4 applies to this substance.
- 2 Other forms of ammonium nitrate may be regarded as explosives. Advice should be sought from the relevant regulatory authority.
- 3 The aggregate quantity at any one time is for import and export.

6.5 LARGER QUANTITIES AT A SPECIAL BERTH

6.5.1 General requirements

Quantities of ammonium nitrate or calcium hypochlorite exceeding those given in Table 6.1 may be handled at a special berth, subject to additional special requirements. Where an ordinary berth is sufficiently isolated and controlled, it may be declared a special berth for a specific time: in such cases the additional special requirements set out below shall apply.

NOTE: The regulatory authority usually declares a special berth.

- (a) A risk assessment shall be carried out and implemented. Any subsequent conditions shall be issued in writing by the port authority.

NOTE: The port authority or the regulatory authority may require this risk assessment.

- (b) A written application for a permit for a special berth shall be lodged with the port authority for each proposed shipment. Such an application shall include the Class, Packing Group, and UN Number of the ammonium nitrate or calcium hypochlorite, the method of packing and the quantities of cargo to be handled at the berth and cargo that is to be retained on board.
- (c) Where a permit is issued for a special berth to be used, the following information shall be included in it:
 - (i) The maximum quantity of ammonium nitrate or calcium hypochlorite to be transported on the ship or handled at the special berth.

- (ii) The grade of ammonium nitrate or calcium hypochlorite, including the UN Number (as listed in the *IMDG Code*).
- (iii) Particulars relating to the special berth.
- (iv) Special requirements as given in Clause 6.6.
- (v) Any additional special requirements determined by the regulatory authority.

NOTE: The port authority usually issues such a permit.

6.5.2 Selection of a special berth

The following items shall be considered when selecting a special berth:

- (a) The total quantity, type and grade of ammonium nitrate or calcium hypochlorite to be transported or handled.
- (b) The packaging, containment and stowage of the ammonium nitrate or calcium hypochlorite.
- (c) The total quantity, type and class of other dangerous cargoes on the ship.
- (d) The geography of the port and the location of the special berth within the port area.
- (e) The berth's proximity to protected places, other ships, other berths, main roads and main railways.
- (f) The materials of construction of the special berth.
- (g) The need to declare a temporary safety distance and a restricted area around the ship and the special berth.
- (h) Any need to temporarily relocate persons for the duration of the immediate removal of ammonium nitrate or calcium hypochlorite from the special berth.
- (i) The type and availability of transport for the immediate removal of the ammonium nitrate or calcium hypochlorite from the special berth.
- (j) The immediate availability of adequate firefighting resources at the special berth.
- (k) Any need to restrict operations to daylight hours.
- (l) Re-routing of land or waterborne traffic.
- (m) Prohibiting the entry of unauthorized persons to the restricted area.
- (n) The proximity to tanks and pipelines.
- (o) Separation from hazardous facilities.
- (p) The need for the ship to have unrestricted passage to open water or other safe area.
- (q) The potential for the release of harmful gases if ammonium nitrate or calcium hypochlorite is involved in a fire, as this can affect some individuals (see Clause 6.5.3).

NOTES:

- 1 The port authority and the regulatory authority usually jointly select a special berth.
- 2 Where these special requirements cannot be strictly complied with, alternative safety requirements or restrictions may be necessary.

6.5.3 Release of harmful gases in a fire

The following recommendations apply when considering the location of a special berth:

- (a) There should be no residential areas, places of public assembly, schools, hospitals or similar occupancies where vulnerable people are concentrated, in any potential evacuation area surrounding the special berth.

- (b) If other activities are carried out within the evacuation area, it should be practicable to warn persons and to evacuate such an area.

NOTE: Decomposing ammonium nitrate and calcium hypochlorite release harmful gases in a fire, which can affect some individuals.

6.5.4 Massive and uncontrollable fire on board ship

In the event of a massive and uncontrollable fire on board ship, all personnel shall be withdrawn and the general public evacuated to a safe distance.

6.6 REQUIREMENTS FOR HANDLING AMMONIUM NITRATE OR CALCIUM HYPOCHLORITE AT A SPECIAL BERTH

6.6.1 General

When handling ammonium nitrate or calcium hypochlorite at a special berth, the following requirements apply:

- (a) The total quantity of ammonium nitrate or calcium hypochlorite transported on the ship, or handled at a special berth, shall not exceed the quantity stated in the permit issued by the port authority.
- (b) Ammonium nitrate or calcium hypochlorite shall be packed, stowed, segregated and handled in accordance with this Section and the *IMDG Code*.
- (c) Before any operations are commenced in the port area, the port authority shall be provided (in writing) with the name of the responsible person in charge of the handling operation.
- (d) Handling operations shall not start until written permission for such operations has been received (see also Clause 6.7).

NOTE: The port authority usually grants such permission.

- (e) Ship and shore personnel shall receive prior training in the correct handling methods, potential dangers and emergency procedures.
- (f) Smoking shall be strictly prohibited on the ship and on the special berth, except in safe areas. Notices shall be prominently displayed on the ship and on the berth bearing the words **DANGER—NO SMOKING—NO NAKED LIGHTS** (see also Clause 2.4.10).

NOTE: Pictograms may be used.

- (g) Hot work shall be prohibited on the ship and in the berth area whilst ammonium nitrate or calcium hypochlorite is being transported or handled within that berth area.
- (h) Where ammonium nitrate or calcium hypochlorite is to be unloaded from a ship, it shall be unloaded as soon as practicable after the ship has berthed.
- (i) Where ammonium nitrate or calcium hypochlorite is to be loaded onto a ship, once loading has commenced, it shall be completed and the ship shall put to sea as soon as is practicable.
- (j) Ammonium nitrate and calcium hypochlorite shall be kept dry at all times.
- (k) If any packaging is damaged or leaking, the spilt material shall be swept up immediately. Spilt ammonium nitrate and its damaged packaging shall be placed into a clean, dry plastic container and removed to a safe place prior to disposal. Spilt calcium hypochlorite shall be treated similarly, but the two substances shall not be mixed.

NOTE: Separate equipment should be used for the cleanup of each of the two substances.

- (l) Incompatible cargo shall not be handled on the ship or on the berth whilst any cargo space containing ammonium nitrate or calcium hypochlorite is open or such goods are being handled.
- (m) Lift trucks shall be—
 - (i) powered by battery, LP Gas or diesel;
 - (ii) fitted with spark arresters where appropriate;
 - (iii) inspected prior to use, to ensure that they are free from leaks; and
 - (iv) attended at all times while in a cargo compartment or storage area.
- (n) The requirements for materials handling equipment set out in AS 4326 shall be consulted.

6.6.2 Requirements relating to the ship

The following requirements shall apply to the ship prior to and during ammonium nitrate or calcium hypochlorite handling operations at a special berth:

- (a) The ship's engines and ancillary equipment shall be kept ready at all times, so that the ship can leave the berth at short notice.
- (b) Except where directed otherwise, the ship shall be berthed in a direction that will allow the quickest departure from the berth in an emergency.
- (c) No bunkering shall take place whilst the ship is handling ammonium nitrate or calcium hypochlorite, unless permitted by the port authority.
- (d) Ammonium nitrate and calcium hypochlorite shall be separated from incompatible cargoes, combustible substances and other dangerous cargoes by a distance of at least 12 m at all times, unless the other dangerous goods are in freight containers.
- (e) Lighting and other electrical cables and equipment shall be protected and kept well clear of ammonium nitrate or calcium hypochlorite cargo. This requirement does not apply to electric forklift trucks and other essential electrical equipment.
- (f) Adequate and appropriate firefighting equipment and water shall be immediately available on the ship and fire hoses shall be run out ready for immediate use.

6.6.3 Requirements relating to the special berth

Where ammonium nitrate or calcium hypochlorite is to be handled at a special berth, the following requirements shall apply:

- (a) Adequate and appropriate firefighting facilities and adequate supplies of water shall be immediately available at the special berth and in the port area.
- (b) Prior to handling the ammonium nitrate or calcium hypochlorite, the special berth shall be thoroughly cleaned free of any substances that could cause contamination. All combustible dusts and debris shall also be removed.
- (c) Other dangerous cargoes, oils and combustible substances shall be excluded from the area where ammonium nitrate or calcium hypochlorite is being handled.
- (d) The quantity of loose bulk ammonium nitrate or calcium hypochlorite shall not exceed that which can be removed within one hour with the available transport.
- (e) Traffic movement shall be controlled around the area in which ammonium nitrate or calcium hypochlorite is being handled.
- (f) Only packages and containers in good order and condition shall be received in the handling area.

- (g) After the ammonium nitrate or calcium hypochlorite has been removed from the berth, the berth shall be cleaned free from all ammonium nitrate or calcium hypochlorite.

6.7 EMERGENCY PROCEDURES

Emergency procedures that have been developed in conjunction with the port authority and the emergency services shall be in place before ammonium nitrate or calcium hypochlorite is handled (see also Clauses 6.5.3 and 6.5.4).

In the event of fire the following instructions should be followed:

- (a) Avoid breathing fumes.
- (b) Call the appropriate emergency service for the port.
- (c) Use plenty of water to fight the fire if it is safe to do so.
- (d) Do not use dry chemical or foam fire extinguishers.
- (e) Do not batten down hatches.
- (f) Do not use steam.

NOTES:

- 1 When large quantities of water are used to combat a fire on a ship, the stability of the ship can be affected. Precautions need to be taken to prevent the ship becoming unstable.
- 2 Consideration should be given to not fighting fires involving ammonium nitrate, due to the risk to emergency responders.

6.8 AMMONIUM NITRATE AND CALCIUM HYPOCHLORITE IN PACKAGES, INTERMEDIATE BULK CONTAINERS, FREIGHT CONTAINERS AND BULK

6.8.1 General requirements

Packagings used for calcium hypochlorite shall comply with the requirements of the *IMDG Code*.

Packagings and freight containers used for ammonium nitrate shall comply with the requirements of the *IMDG Code*.

6.8.2 Bulk shipments of ammonium nitrate (UN 1942)

Bulk shipments of ammonium nitrate (UN 1942) on a ship shall—

- (a) have special permission from the relevant authority for the port of loading; and
- (b) comply with the requirements of the *BC Code*.

6.8.3 Ammonium nitrate based fertilizers in bulk on a ship

Ammonium nitrate based fertilizers shall not be loaded directly into the cargo spaces of a ship at a special berth unless written permission has been obtained from the regulatory authority and the requirements of this Section of the Standard have been met.

Where ammonium nitrate is transported and handled in bulk on a ship, the requirements of this Standard, the *BC Code* (including the appropriate tests prescribed in that Code) and any other requirements specified by the regulatory authority, shall be met. The port authority shall be provided with a copy of the test certificate, issued and signed by the manufacturer, stating that the requirements of the tests set out in the *BC Code* have been met.

SECTION 7 DANGEROUS CARGOES OF DANGEROUS GOODS CLASS 7

7.1 SCOPE OF SECTION

This Section sets out requirements and recommendations for the handling and transport of Class 7 (radioactive) dangerous goods in port areas. It also provides information on the classification and hazards of Class 7 dangerous goods.

NOTES:

- 1 Any materials with a specific activity greater than 70 kBq/kg are declared radioactive.
- 2 Further advice may be obtained from the appropriate Commonwealth, State or Territory advisory authority.

7.2 GENERAL REQUIREMENTS

Packages or freight containers containing radioactive substances shall not be brought into the port area unless they conform to the International Atomic Energy Agency (IAEA) *Regulations for the Safe Transport of Radioactive Material*, 1996 Edition (Revised), which is incorporated in ARPANSA RP 2, *Code of Practice for the Safe Transport of Radioactive Material*, under the *Australian Radiation Protection and Nuclear Safety Act*.

NOTE: The *IMDG Code* also requires compliance with the IAEA *Regulations for the Safe Transport of Radioactive Material*, mentioned above.

7.3 EXPOSURE TO DANGEROUS CARGOES OF CLASS 7

7.3.1 Introduction

The requirements of the *Recommended Radiation Protection Standards for Individuals Exposed to Ionizing Radiation*, as determined by the International Commission on Radiation Protection (ICRP) and adopted by the National Health and Medical Research Council (NHMRC), apply.

7.3.2 Dose limit

For personnel handling radioactive substances in port areas, the dose limit is that for members of the public (i.e. that, for non-occupationally exposed persons), which is 1 millisievert (mSv) per year. This limit shall not be exceeded.

NOTES:

- 1 The dose limit is a limit on the additional radiation dose to an individual, over and above the background.
- 2 Under special circumstances, a higher effective dose may be allowed in a single year, provided that the average dose over 5 years does not exceed 1 mSv per year.

7.3.3 Radiation monitoring

7.3.3.1 General

Where radiation monitoring is considered necessary, it shall be carried out in accordance with regulatory requirements.

7.3.3.2 Uranium oxide and monazite sands

Provided that the requirements relating to the handling of radioactive substances given in this Standard are followed, radiation exposure from shipments of uranium oxide or monazite sands should be low. Radiation monitoring of personnel working in the port area is not required where these substances are handled.

NOTES:

- 1 Uranium oxide and monazite sands are classified as low specific activity (LSA) materials in the *Regulations for the Safe Transport of Radioactive Materials*.
- 2 Further advice should be obtained from the appropriate Commonwealth, State or Territory advisory authority.

7.3.3.3 Exposure of shore-based personnel

If, over a year, persons might be expected to spend an average of more than 10 h per week in a store or area where packages or freight containers of Class 7 dangerous goods are present, more stringent measures (e.g. personal monitoring of radiation doses) shall be adopted.

NOTE: Further advice may be obtained from the appropriate Commonwealth, State or Territory advisory authority.

7.4 TRANSPORT OF DANGEROUS CARGOES OF CLASS 7

7.4.1 General

The following requirements apply to the transport of Class 7 dangerous goods in port areas:

- (a) Trucks loaded with radioactive substances shall be scheduled so as to avoid waiting in the port area.
- (b) Radioactive substances shall not be received into the port area more than 24 h prior to the time of shipment.

NOTE: Low specific activity (LSA) substances belonging to Schedules 5, 6 and 7 for Class 7 materials (as given in the *IMDG Code*), and having no subsidiary risk, may be held in a restricted area within the port for up to five days if application has been made to and accepted by the regulatory authority.

7.4.2 Restriction on Transport Index (TI)

7.4.2.1 Introduction

The Transport Index (TI) is a single number assigned to a package, overpack, tank or freight container, or to unpackaged LSA-1 or SCO-I material. It is used to provide control over both nuclear criticality safety and radiation exposure.

NOTE: The *IMDG Code* provides a method of determining the Transport Index.

7.4.2.2 Transport Index greater than 50

Whenever a freight container having a Transport Index greater than 50 is to be transported to or from a ship at a berth or in a port area, the following requirements apply.

- (a) The freight container shall be transported under the conditions for a 'Full Load' or 'Exclusive Use', as set out in the *Australian Code of Practice for the Safe Transport of Radioactive Material*.
- (b) The radiation level shall not exceed—
 - (i) 2 mSv/h (200 millirem/h) at any point; and
 - (ii) 0.1 mSv/h (10 millirem/h) at 2 m from the outside of the freight container.

- (c) None of the outer dimensions of the freight container shall be less than 1.5 m, and the internal volume shall be greater than 3 m³.
- (d) The freight container shall be taken directly to or from a ship, and not be held on a berth for any period.

7.5 ONSHORE STORES AND AREAS FOR DANGEROUS CARGOES OF CLASS 7

7.5.1 General requirements

All packages and freight containers containing fissile material (Fissile Classes II and III) carry a yellow 'radioactive' label ('yellow label'), showing the Transport Index (described in Clause 7.4.2). The requirements of Clause 7.5.5 relate solely to the criticality precaution implied by the Transport Index and do not relate to radiation control.

Fissile Class II and III packages and freight containers form only a small proportion of the total traffic in radioactive substances.

The following requirements apply to the arrangement of Class 7 dangerous goods on shore:

- (a) On shore, packages and freight containers shall be arranged and stacked in such a way as to eliminate the risk of criticality hazard.
- (b) The requirements relating to the 50 Transport Indices limit apply to all 'yellow label' consignments other than those containing only Low Specific Activity (LSA) material.
- (c) A separation distance of 6 m shall apply to all 'yellow label' consignments.
- (d) The requirements for 'yellow label' packages and freight containers set out in this Clause (7.5) shall be applied regardless of whether the stacks are separated by walls or ceilings.

NOTE: The intervening space may be used for the storage of other goods except dangerous cargoes with which common loading or storage is prohibited, or goods that are incompatible due to the effects of radiation (e.g. photographic film, or mail bags).

7.5.2 Separation from places frequented by persons

Packages or freight containers bearing the yellow 'radioactive' label shall be separated from any place frequented by persons by at least the distances given in Table 7.1, unless measurements taken using a suitable instrument clearly show that the radiation level at all points outside that place is less than 7.5 microsievert (μSv).

Where the package or freight container is not kept in a special store, an area as given in Table 7.1 shall be barred or marked off. Unauthorized access to such an area shall be prohibited.

7.5.3 Separation from other areas

Stacks of packages or freight containers shall be located so that they are at least 13 m from rest rooms, offices or any other areas where people are likely to be present.

7.5.4 Separation between stacks

A clear distance of 6 m shall be maintained between stacks of packages or freight containers.

7.5.5 Stack size

The number of 'yellow label' packages or freight containers stacked together, other than those containing Low Specific Activity (LSA) materials, shall be limited so that the cumulative total of transport indices (TI) does not exceed 50.

7.5.6 Operational requirements for onshore special stores and areas

The following requirements shall also apply to onshore special stores and areas in which radioactive substances are kept:

- (a) Entry into such a store or area shall be for essential duties only, and time spent in handling packages shall be kept to a minimum.
- (b) The special store or area shall be clearly marked with signs that—
 - (i) indicate that unauthorized entry is prohibited, and that entry to the store is restricted to essential operations only; and
 - (ii) are illuminated at night.
- (c) Sufficient equipment, including overalls, masks, brooms, shovels and empty drums, shall be readily available at the berth, for use in cleaning up any spillage or accident involving radioactive substances.

TABLE 7.1
SEPARATION DISTANCE FROM ‘YELLOW LABEL’
PACKAGES OR FREIGHT CONTAINERS
TO PLACES FREQUENTED BY PERSONS

Sum of transport indices	Minimum segregation distance m
≤5	4
>5 ≤10	6
>10 ≤20	8
>20 ≤30	10
>30 ≤40	12
>40 ≤50	13
>50 ≤100	18
>100 ≤150	22
>150 ≤200	26

NOTES:

- 1 For two or more stacks of packages or freight containers see Clauses 7.5.3, 7.5.4 and 7.5.5.
- 2 The segregation distance applies regardless of whether walls or ceilings intervene between the storage area and the occupied place.

7.6 STOWAGE ON BOARD SHIP

On board ship, radioactive substances shall be stowed in accordance with the segregation requirements set out in the *IMDG Code*.

NOTE: Special conditions that allow for higher levels of radioactivity apply when freight containers packed with radioactive substances are shipped under ‘Full Load’ or ‘Exclusive Use’ provisions. Such shipping requires detailed supervision and control and is appropriate for consignments of materials such as uranium oxide and monazite sands but is not usually encountered in normal shipping operations.

7.7 HANDLING OF CLASS 7 DANGEROUS GOODS

The following requirements apply when handling Class 7 substances in port areas:

- (a) Cargo handling operations shall be arranged so that personnel spend minimal time close to the radioactive substances.

- (b) All precautions shall be taken to avoid unnecessary personal exposure. No personnel shall be permitted within the vicinity of container-loads of radioactive substances unless they are actually handling or securing them, or involved in other cargo operations in adjacent areas.
- (c) All personnel involved in handling freight containers containing radioactive substances shall withdraw by a distance of at least 5 m when not required at the container face and when waiting for the next container.
- (d) When lift trucks are used to handle freight containers containing radioactive substances, the container shall be lifted by using a spreader fitted to the truck, or in such a manner as to avoid puncturing the container with the tines of the truck.

NOTE: The port authority may require a technical representative of the consignor to be present.

7.8 DAMAGE, SPILLAGE AND LEAKAGE

In the event of accidental damage to a package or freight container that contains radioactive substances, or where there is evidence of a spill or leak, the following procedures shall be followed:

- (a) All steps shall be taken to avoid contact with, or inhalation of, the radioactive substances.
- (b) The appropriate Commonwealth, State or Territory advisory authority, the regulatory authority, the port authority and the owner of the radioactive substances shall be informed immediately.
- (c) The spillage shall be cleaned up immediately, by properly equipped and trained personnel. All other personnel shall remain upwind of the spillage or accident site, or withdraw from the area.
- (d) Unauthorized persons shall not be allowed to return to the spillage or accident site until the area is declared safe.

NOTE: Such a declaration would normally be made by the appropriate Commonwealth, State or Territory authority.