



Australian Government
Australian Maritime Safety Authority

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Marine Order 32, issue 3 (Cargo handling equipment)

I, Mick Kinley, Acting Chief Executive Officer of the Australian Maritime Safety Authority, make this Order under subsection 425(1AA) of the *Navigation Act 1912*.

Mick Kinley
Acting Chief Executive Officer

29 November 2011

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Section 1

Division 1 Preliminary**1 Name of Order**

This Order is *Marine Order 32, issue 3*.

2 Commencement

This Order commences on the day after it is registered.

3 Repeal of *Marine Orders Part 32, issue 2*

Marine Orders Part 32, issue 2 is repealed.

4 Purpose

4.1 This Order:

(a) prescribes matters for:

- (i) the inspection and testing of machinery and appliances for loading or unloading ships, off-shore industry vessels and off-shore industry mobile units; and
- (ii) the prevention of the use of defective machinery or appliances for loading or unloading ships, off-shore industry vessels and off-shore industry mobile units; and
- (iii) the protection of the health and the security from injury of persons engaged in loading or unloading ships, off-shore industry vessels and off-shore industry mobile units; and
- (iv) the transfer of persons and goods to or from off-shore industry mobile units, including the provision, maintenance and use of cranes and other lifting devices and equipment; and

(b) gives effect, in whole or in part, to the following instruments of the International Labour Organization:

- (i) Convention No. 27, Marking of Weight (Packages Transported by Vessels), 1929;
- (ii) Convention No. 152, Occupational Safety and Health (Dock Work), 1979;
- (iii) Recommendation No.160, Occupational Safety and Health (Dock Work), 1979;
- (iv) the ILO Code.

4.2 This Order regulates the use of material handling equipment, whether ship or shore equipment, when the equipment is used for loading or unloading ships.

5 Power

5.1 Paragraph 425(1)(a) of the Navigation Act provides that the regulations may provide for the inspection and testing of machinery and appliances for the loading and unloading of ships.

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- 5.2 Paragraph 425(1)(b) of the Navigation Act provides that the regulations may provide for the prevention of the use of defective machinery or appliances for the loading or unloading of ships.
- 5.3 Paragraph 425(1)(c) of the Navigation Act provides that the regulations may provide for the protection of the health and the security from injury of persons engaged in the loading or unloading of ships.
- 5.4 Paragraph 283E(1)(c)(xiii) of the Navigation Act provides that the regulations may provide for the transfer of persons and goods to or from off-shore industry mobile units, including the provision, maintenance and use of cranes and other lifting devices and equipment.
- 5.5 Paragraphs 283D(1)(b) and 283E(1)(b) of the Navigation Act provide that the regulations may provide for off-shore industry vessels and off-shore industry mobile units for any matter for which provision is made by the Navigation Act.
- 5.6 Section 257 of the Navigation Act provides that the regulations may provide for giving effect to the loading, stowing or carriage in ships of cargo, or for the unloading of cargo from ships.

Note Subsection 257(3) of the Navigation Act provides that a person who is guilty of an offence under the regulations made under section 257 of the Navigation Act is punishable on conviction by a fine not exceeding \$5 500.

- 5.7 Subsection 425(1) of the Navigation Act provides for regulations to be made prescribing matters required or permitted to be prescribed, or that are necessary or convenient to be prescribed, for carrying out or giving effect to the Navigation Act.
- 5.8 Subsection 425(1AA) of the Navigation Act provides for the making of orders for matters (other than the imposition of penalties) that can be made by the regulations.

6 Definitions

In this Order:

AMSA means the Australian Maritime Safety Authority established by the *Australian Maritime Safety Authority Act 1990*.

bulk carrier means a ship that is intended primarily to carry dry cargo in bulk, including an ore carrier or a combination carrier.

cargo includes:

- (a) ship's stores, provisions, equipment and fuel; and
- (b) mails; and
- (c) passengers' baggage; and
- (d) material and equipment for:
 - (i) the repair of a ship; or
 - (ii) the fitting of a cargo space; or
 - (iii) securing cargo; and

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- (e) mechanical stowing appliances and transport equipment when carried as cargo or being handled by means of cranes or derricks.

cargo gear means an article, for use with a lifting appliance in loading or unloading cargo, that:

- (a) is not permanently attached to the lifting appliance; and
(b) is designed to be detachable from the lifting appliance.

Examples

wire rope, fibre rope, sling, net, clamp, grab, pallet bar, lifting beam, lifting frame, spreader, tray, tub, scrap bin or other cargo receptacle, magnetic lifting device, vacuum lifting device, patent cargo handling system or self unloading system.

cargo space, for a ship, means a space intended for the carriage of cargo, including a trunkway or hatchway to the space.

cargo transport unit or **CTU** means a road freight vehicle, a railway freight wagon, a freight container, a road tank vehicle, a railway tank wagon or a portable tank.

competent person, for material handling equipment, means a person who:

- (a) for carrying out testing and associated thorough examination and issuing certificates of test for the equipment under this Order — is appointed by:
- (i) the manufacturer of the equipment; or
 - (ii) a classification society under a scheme of classification or certification of the equipment; or
 - (iii) a competent testing establishment; or
- (b) for carrying out thorough examinations, other than those associated with testing, of the equipment under this Order or for determining the safe working load of cargo gear that is not required to be permanently marked with a SWL:
- (i) is appointed by:
 - (A) for ship's equipment — the owner or master of the ship; or
 - (B) for shore equipment — the owner; or
 - (C) a classification society under a scheme of classification or certification of the equipment; and
 - (ii) if the person is a crew member appointed under sub-subparagraph (i)(A) — holds any of the following positions on board the ship:
 - (A) Master;
 - (B) Chief Mate;
 - (C) Chief Engineer;
 - (D) First Engineer.

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container means an article of transport equipment, including a container carried on a chassis, but not including a vehicle or packaging:

- (a) of a permanent character and strong enough to be suitable for repeated use; and
- (b) specially designed to facilitate the transport of goods, by 1 or more modes of transport, without intermediate reloading; and
- (c) designed to be secured or readily handled, having corner fittings for this purpose.

dangerous goods means goods to which the IMDG Code is expressed to apply, whether or not specifically listed in the IMDG Code.

duty surveyor means a surveyor on duty at:

- (a) for a port where an AMSA office is located — the AMSA office; or
- (b) for any other port — the AMSA office nearest to the port.

fibre rope means a rope constructed of natural or synthetic fibre.

hatchway means an opening that provides access to a cargo space for loading or unloading.

ILO Code means the ILO Code of Practice *Safety and Health in Ports, 2005*, published by the International Labour Organization.

illumination means the measured intensity of light in the horizontal plane 1 m above the working surface.

IMDG Code has the same meaning as in *Marine Orders Part 41 (Carriage of dangerous goods)*.

inspection, for material handling equipment, means a careful visual examination including, if necessary, dismantling, to assess the condition of any part of the equipment for any defect impairing its operational reliability.

intermediate bulk container or **IBC** means a rigid or flexible portable packaging, other than those specified in chapter 6.1 of the IMDG Code, that:

- (a) has a capacity of:
 - (i) not more than 3.0 m³ (3 000 litres) for solids and liquids of packing groups II and III; or
 - (ii) not more than 1.5 m³ for solids of packing group I when packed in flexible, rigid plastics, composite, fibreboard or wooden IBCs; or
 - (iii) not more than 3.0 m³ for solids of packing group I when packed in metal IBCs; or
 - (iv) not more than 3.0 m³ for radioactive material of class 7; and
- (b) is designed for mechanical handling; and
- (c) is resistant to stresses produced in handling and transport, as determined by tests that are consistent with:
 - (i) Chapter 6.5 of the IMDG Code; or

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- (ii) Chapter 6.5 of the Recommendations on the Transport of Dangerous Goods — Model Regulations Rev. 14, published by the United Nations, 2005; or
- (iii) Australian Standard AS3668-1989.

lifting appliance means a stationary or mobile cargo-handling appliance used on board ship for suspending, raising or lowering or moving loads from one position to another while suspended or supported, including a crane, a derrick crane, a derrick, a cargo lift and a mechanical ramp.

loading means conveying cargo from a location outside a ship to a location on board a ship or transferring cargo between locations on board a ship, including associated operations such as lashing and securing of cargo and inserting clamps and pins in securing devices, but not including transferring between locations on board the ship:

- (a) stores, provisions, equipment and fuel belonging to the ship; or
- (b) mails; or
- (c) passengers' luggage.

loose gear means an item of equipment that can be used to attach a load to a lifting appliance but that does not form an integral part of the appliance or load, including a block, shackle, hook, swivel, connecting plate, ring, chain block or hoist, chain or overhauling weight.

material handling equipment means an article or an integrated assembly of articles designed to convey or for use in conveying cargo, including lifting appliances, cargo gear, loose gear, mechanical stowing appliances or personnel cradles.

mechanical stowing appliance means a wheeled or tracked machine or vehicle designed to convey or move cargo, including a lift truck, straddle truck, side-loader, tractor, bulldozer, front-end loader, trailer or truck.

operator, for a ship, means the owner of the ship or any other organisation or person, such as the manager or the bareboat charterer, who has assumed the responsibility for operation of the ship from the shipowner and who, on assuming that responsibility, has agreed to take over all the duties and responsibility imposed by the International Safety Management Code 2002.

owner, for shore equipment used in loading or unloading a ship, includes the person having possession of the equipment for the purpose of the loading or unloading operation.

pallet means a load-carrying platform having 2 interconnected decks separated to permit the entry of lifting equipment, such as fork arms, tines, bars or slings.

person in charge means a person appointed under section 14.

personnel cradle means a device that is attached to a lifting appliance for the purpose of lifting people.

register of material handling equipment means the register mentioned in Division 6.

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responsible person means a person having practical and theoretical knowledge and experience sufficient to enable that person to detect and evaluate any defects and any weaknesses that may affect the intended performance of materials handling equipment.

Examples

For carrying out thorough annual examinations, and other inspections, of unclassified cargo gear and lifting appliances — Chief Officers, Chief Engineer Officers, First Engineer Officers.

returnable cargo unit means a packaging, into which cargo is packed, intended to convey cargo from consignor to consignee and that:

- (a) is designed to be handled as a single unit; and
- (b) is not a freight container or intermediate bulk container; and
- (c) is fitted with integral lifting attachments; and
- (d) is intended for return and subsequent re-use; and
- (e) may or may not be collapsible.

runner means a wire rope used for raising or lowering a load.

safe working load or **SWL** means the maximum gross load that may be safely lifted by a lifting appliance or item of loose gear in a given condition.

Note SWL may also be called ‘rated load’ or ‘working load limit’.

self unloading system, for handling bulk cargoes, means an arrangement of devices and equipment on board a ship, designed so that unloading is effected without recourse to the use of grabs, tubs or similar items of cargo gear in conjunction with cranes or derricks.

shipborne barge means an independent, non-self-propelled vessel, specifically designed and equipped to be lifted in a loaded condition and stowed on board a ship.

ship equipment means material handling equipment carried or installed on board a ship.

shipper means a person who prepares a consignment for transport, including, for goods shipped by container or vehicle in less than full container or vehicle load, the consolidator of the goods.

shore equipment means material handling equipment, including a floating crane, that is not ship equipment.

solid bulk cargo means cargo, other than a liquid or a gas, that is a combination of particles, granules or any larger pieces of material generally uniform in composition and is loaded directly into the cargo space of a ship without an intermediate form of containment.

testing establishment means an establishment equipped for the testing and examination of material handling equipment.

thorough examination means a detailed visual examination, supplemented if necessary by other suitable means or measures, in order to arrive at a reliable conclusion as to the safety of the equipment examined.

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transport equipment means equipment of a permanent character that is used in the transport of a combination or aggregation of cargo as a single unit, including containers, intermediate bulk containers, returnable cargo units and shipborne barges, but not including cargo gear.

tray means an article of material handling equipment, designed for repeated use in conveying cargo, that has attachments by which it may be raised or otherwise conveyed, but does not include a CTU or a pallet.

unloading mean conveying cargo located on board a ship to a location outside the ship, including associated operations such as unlashings of cargo and removing clamps and pins from securing devices.

Note 1 Some terms used in this Order are defined in *Marine Order 1 (Administration)*. For example:

- Manager, Ship Inspection and Registration
- Navigation Act.

Note 2 Other terms used in this Order have the same meaning that they have in the Navigation Act. For example, the following terms are defined in the Navigation Act:

- master
- port
- ship
- survey authority
- surveyor.

Note 3 Approved survey authorities are listed in *Marine Order 1 (Administration)*.

7 Interpretation

In this Order:

- (a) a reference to the date when a ship was built means the date when:
 - (i) the keel was laid; or
 - (ii) construction identifiable with the ship has begun and the lesser of at least 50 tonnes, or 1% of the estimated mass of all structural material, of the ship has been assembled; and
- (b) a reference to loading or unloading a ship includes a situation in which both loading and unloading is taking place.

Note for paragraph (a) MSC-MEPC.5/Circ 4 gives guidance on the interpretation of the date on which a keel is laid.

8 Application

8.1 This Order applies to:

- (a) the loading or unloading of any ship at a port in Australia, in an external territory of Australia, in the territorial sea of Australia or in waters on the landward side of the territorial sea of Australia; and
- (b) the loading or unloading anywhere of a ship to which Part II of the Navigation Act applies; and

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(c) the loading or unloading of an off-shore industry mobile unit.

Note Because of section 283K of the Navigation Act, this Order does not have effect to the extent that it is inconsistent with regulations made under the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* or with a valid direction given under section 305 of that Act.

8.2 Without limiting subsection 8.1, this Order is not intended to exclude or limit the concurrent operation of any law of a State or Territory that imposes additional obligations or liabilities on a person.

9 Exemptions and equivalents

9.1 A person may apply for an exemption from a requirement of this Order, or for acceptance of an equivalent measure, in accordance with the application process set out in *Marine Order 1 (Administration)*.

9.2 Exemptions

9.2.1 The Manager, Ship Inspection and Registration may exempt a ship or class of ships from compliance with a provision of this Order to the extent and subject to the conditions that he or she determines.

9.2.2 A duty surveyor may, on written request, if satisfied that persons will not be endangered, allow any provision of this Order to be dispensed with for the purpose of a loading or unloading operation, to the extent and subject to the conditions that he or she determines.

9.3 Equivalents

9.3.1 If this Order requires a particular fitting, material, appliance or apparatus, or a type of it, to be fitted or carried in a ship or a particular provision to be made in a ship, the Manager, Ship Inspection and Registration may allow another fitting, material, appliance or apparatus, or a type of it, to be fitted or carried, or another provision to be made, if he or she is satisfied that the other fitting, material, appliance or apparatus, or type of it, or provision, is at least as effective as that required by this Order.

Division 2 Powers and functions of surveyors**10 Inspection**

10.1 The master of a ship whose equipment is used for loading or unloading on board a ship must allow a surveyor to inspect, at any time, material handling equipment to which this Order applies.

This is a penal provision.

10.2 The owner of shore equipment used for loading or unloading on board a ship must allow a surveyor to inspect, at any time, material handling equipment to which this Order applies.

This is a penal provision.

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11 Defect notice

11.1 If a surveyor is satisfied that material handling equipment is defective, he or she:

- (a) must give written notice of the defect to:
 - (i) the master of the ship in which the equipment is used or the owner of the equipment, and
 - (ii) the person in charge, and
- (b) may prohibit the use of the equipment for loading or unloading a ship.

11.2 Material handling equipment is defective if, inter alia, it has not been tested, thoroughly examined, or inspected as required by Schedule 4 to this Order.

11.3 A person to whom the notice is given must not permit the material handling equipment to be used until:

- (a) the defect mentioned in the notice has been rectified; and
- (b) the prohibition has been withdrawn by a surveyor.

This is a penal provision.

12 Weighing of cargo or appliance

A surveyor may, for any purpose of this Order, require the shipper to weigh an article of cargo or a mechanical stowing appliance and may for that purpose nominate the weighing instrument.

13 Unsafe arrangements

13.1 If a surveyor considers that a loading or unloading operation is or will be unsafe, whether or not the other provisions of this Order are complied with, he or she may give written direction to the person in charge and, if appropriate, to the master of the ship, prohibiting the loading or unloading operation.

13.2 A person must not carry out any loading or unloading operation subject to the direction until a surveyor is satisfied that the operation is safe and the direction is withdrawn.

This is a penal provision.

Note Giving or withdrawing a prohibition notice does not affect action that may be taken for an Australian ship under the *Occupational Health and Safety (Maritime Industry) Act 1993*.

Division 3 Person in charge**14 Identifying the person in charge**

14.1 A person, other than the master, who undertakes to load or unload a ship at a port in Australia must, before starting an undertaking subject to this Order, appoint a person or persons in charge of the undertaking.

Note If the person undertaking loading or unloading is a firm or company, that firm or company must make the appointment.

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- 14.2 A person making an appointment under subsection 14.1 must, before commencement of the undertaking, provide to the master of the ship written notification of the appointment or appointments.

This is a penal provision.

- 14.3 A person in charge must, when starting or ceasing duty as person in charge, enter in a logbook:
- (a) the time at which he or she starts each period of duty as person in charge; and
 - (b) the time he or she ceases each period of duty as person in charge.

This is a penal provision.

- 14.4 A person who has started a period of duty in charge of loading or unloading of a ship is taken to remain person in charge:
- (a) until the person has directed loading or unloading of the ship to cease and has made an entry to that effect in the logbook; or
 - (b) until another person appointed under subsection 14.1 has started a period of duty as person in charge and has made an entry to that effect in the logbook; or
 - (c) the person appoints another person to be person in charge for any period in which the person is unable to continue the period of duty.

- 14.5 Only 1 person at a time is to be person in charge.

- 14.6 A person must not be appointed as the person in charge unless the person is:

- (a) well experienced in all aspects of the type of loading or unloading to be undertaken; and
- (b) capable of directing all tasks relevant to the loading or unloading.

- 14.7 A person appointed under subsection 14.1, being unable to direct the loading or unloading of a ship at any time during his or her period of duty, may appoint a person qualified in accordance with subsection 14.6 to direct the loading or unloading during the period of the inability.

- 14.8 A person appointed under subsection 14.7 is taken to be the person in charge for the period of the inability.

- 14.9 If cargo is being loaded or unloaded by crew of the ship, the master of the ship is taken to be the person in charge.

15 Functions and duties of person in charge

- 15.1 It is the function of the person in charge to direct the tasks relevant to the loading or unloading of the ship and to ensure that they are carried out in a safe and orderly manner.

- 15.2 It is the duty of the person in charge to take all reasonable steps necessary to discharge his or her function, and in particular to ensure as far as practicable that:

- (a) all operations are performed in compliance with this Order; and

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- (b) the materials handling equipment of the ship has been tested, thoroughly examined and inspected as required by this Order; and
- (c) persons are not engaged in loading or unloading unless they have been given adequate instruction and training concerning the risks involved and precautions to be taken; and
- (d) all persons are reasonably protected against accidental injury arising from the loading or unloading of the ship, and from movement of unsecured cargo or other objects on the ship; and
- (e) persons not engaged in the loading or unloading of the ship or having any other proper function in connection with the loading or unloading, do not remain:
 - (i) in the vicinity of cargo-handling operations; or
 - (ii) on any deck where roll-on/roll-off loading or unloading is taking place; unless those persons have the permission of the master or a person authorised by the master to give permission; and
- (f) if a workplace becomes unsafe or there is a risk of injury to health, effective measures are taken to protect the workers until the place has been made safe again; and
- (g) the master of the ship is told about any event in which:
 - (i) a person receives an injury; or
 - (ii) a component of material handling equipment fails in operation, whether or not any person is injured because of the failure.

15.3 If, in connection with the loading or unloading of a ship:

- (a) a person receives an injury; or
- (b) a component of material handling equipment fails in operation, whether or not any person is injured because of the failure;

the master, on advice from the person in charge, must give to the Manager, Ship Inspection and Registration:

- (c) within 4 hours after the incident — an initial report; and
- (d) within 72 hours after the incident — a full report.

This is a penal provision.

Note Incident reporting forms (AMSA 18 and AMSA 19) are available on AMSA's website at <http://www.amsa.gov.au>.

Division 4 Loading and unloading

16 Person in charge to direct loading and unloading

A person must not, to any extent, load or unload a ship unless that person does so under the direction of the person in charge.

This is a penal provision.

17 Loading and unloading to comply with this Order

The person in charge, the master of a ship or the terminal operator must not, other than in accordance with this Order:

- (a) to any extent, load or unload a ship; or
- (b) use or operate any material handling equipment in connection with the loading or unloading of a ship; or
- (c) direct or purport to authorise any other person to load or unload a ship to any extent, or operate material handling equipment in connection with the loading or unloading of a ship; or
- (d) use or direct or purport to authorise any other person to use in connection with the loading or unloading of a ship, except in the event of an emergency, any means of passage or access.

This is a penal provision.

18 Use of equipment

- 18.1 A person who is not qualified under law of a State or Territory to do any of the things mentioned in subsection 18.2 must not do any of those things for which he or she is not qualified.

This is a penal provision.

- 18.2 The things are the following:

- (a) operate any mechanical stowing appliance, crane or winch;
- (b) give directional signals to a driver of a crane, winch or other mechanical stowing appliance;
- (c) have responsibility for attending to cargo falls on winch ends or winch drums;
- (d) perform tasks involving raising, lowering or otherwise adjusting derrick gear or other material handling equipment.

Note ISO 15513 provides guidance on the competency requirements for crane drivers (operators), slingers, signallers and assessors. Further guidance on the training of crane drivers can be found in ISO 9926: *Cranes—Training of drivers*.

- 18.3 Subsection 18.1 does not apply if the person:

- (a) both:
 - (i) acts under the direction of the person in charge of the ship or equipment; and
 - (ii) complies with the directions of the person in charge; or
- (b) is a member of the crew of the ship being loaded or unloaded; or
- (c) is a person under training while properly supervised.

Note Occupational health and safety legislation may also apply.

- 18.4 A person must not operate power operated hatch covers if the person is not:

- (a) a member of the crew of the ship being loaded or unloaded; or

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- (b) authorised to do so by the duty officer on the ship watch or the Chief Officer or master of the ship.

This is a penal provision.

- 18.5 A person, other than a member of the crew of the ship, must not operate ship's side, bow or stern doors, 'tween deck bulkhead doors, ramps, retractable car decks or other ship equipment related to cargo space access if the person has not been authorised by the master of the ship to do so.

This is a penal provision.

- 18.6 A person must not, at any time, use an item of material handling equipment, mechanical ventilation equipment, lighting or other equipment used in loading and unloading for a purpose other than its intended purpose.

This is a penal provision.

- 18.7 A person must not use an item of material handling equipment other than in compliance with Schedule 6.

This is a penal provision.

19 Operations to or from a barge or lighter

The person in charge must not permit cargo to be loaded into a ship from a manned barge or lighter, or unloaded from a ship into a manned barge or lighter, if there is not at least 1 lifebuoy, with at least 30 m of buoyant line attached, on the barge or lighter.

This is a penal provision.

20 Removal of equipment

- 20.1 A person must not, during the loading or unloading of a ship, remove or otherwise interfere with any fencing, safety device, gangway, means of access, ladder, lighting, hatchway cover, material handling equipment, stage, mark, life-saving appliance or other article or fitting provided in connection with loading or unloading for the purpose of compliance with this Order, except:

- (a) in the event of an emergency; or
(b) as directed by the master or an officer of the ship, or by the person in charge.

- 20.2 The person who directs or effects the removal of an article or fitting in accordance with subsection 20.1 must replace it as soon as there is no longer any reason for its removal, by the person effecting or directing the removal, as appropriate.

- 20.3 Every person engaged in loading or unloading a ship must take all reasonable steps to protect the person's own safety and that of other persons. The fact that a person in charge is directing the operation or that the provisions of this Order are being correctly applied does not relieve a person of that obligation.

Section 21**21 Reporting of dangerous situations**

If a person engaged in the loading or unloading of a ship thinks that a dangerous situation exists, and cannot reasonably remove the danger, the person must report the situation to the person in charge as soon as practicable.

22 Dock work safety — general requirements

The master, or the person in charge, of a ship being loaded or unloaded must not permit loading or unloading to take place contrary to Schedule 1.

23 Access to ships in port — general requirements

23.1 A person engaged in loading or unloading of a ship must not board or leave the ship on foot other than by a means of access mentioned in 23.2.

23.2 The means of access from the wharf to a ship's deck for use by a person engaged in loading or unloading of a ship must comply with Schedule 9 of *Marine Orders, Part 21 (Safety of navigation and emergency procedures)*.

Note The means of access may be provided by the ship or the shore terminal.

23.3 Subject to subsection 23.2, the means of access must:

- (a) be placed so that no loads pass over it; and
- (b) be placed where access to it will not be obstructed; and
- (c) not be placed where it could be struck by moving traffic on a crane track, railway track or other route; and
- (d) be adequately illuminated in accordance with clause 2 of Schedule 1.

23.4 However, if it is not practicable for the means of access to comply with any or all of paragraphs 23.3(a), (b) and (c), it must be supervised at all times during cargo handling.

23.5 Access to spaces and lifting appliances on board a ship must comply with Schedule 2.

23.6 The master of a ship must take such precautions that are reasonable and appropriate, in accordance with clause 1 of Schedule 1, to prevent access by persons to a space that may have an unsafe atmosphere, including a space that has been fumigated, until the master is satisfied that the atmosphere in that space has been determined to be safe.

Note Recommendations on appropriate safety measures to be taken when using pesticides on ships are to be found in the Supplement to the IMDG Code. Other authorities, such as port authorities, may have additional requirements that must be met.

24 Marking of cargo mass

24.1 The shipper of an individual article of cargo, or unitised articles of cargo of 1 tonne gross mass or more, to be loaded on or unloaded from a ship at a port in Australia, must mark the cargo with its gross mass in accordance with Schedule 9.

This is a penal provision.

Section 25

Note An article of cargo, or unitised articles of cargo, could include a container, a portable tank, an intermediate bulk container, a returnable cargo unit, logs, timber, steel products, break bulk and pre slung cargo.

- 24.2 A shipper must not provide information, or place a marking on, a unitised article of cargo mentioned in subsection 24.1, that indicates a false gross mass or a false maximum gross mass.

This is a penal provision.

- 24.3 A marking or representation is not taken to be false if the actual mass of the unitised article of cargo is less than:

- (a) the declared mass, or
- (b) if no mass is declared — the SWL or maximum gross mass marked on the unitised article of cargo.

Division 5 Safe working load**25 Drawings and operational instructions**

- 25.1 The operator of a ship on which lifting appliances are installed for use in loading or unloading the ship must at all times keep on board the ship a rigging plan, drawings and instructions for their use.

This is a penal provision.

- 25.2 The operator of a ship on which lifting appliances are installed for use in loading or unloading must provide details of any operational limitations of the lifting appliances.

Note Operational limitations may include outreach radius limitations at different SWL, restrictions due to sea state while working offshore and reduction in SWL when multiple cranes are used with a single heavy lift.

26 Determination and marking

The person in charge must not permit the use of an article of material handling equipment in loading or unloading a ship unless a competent person, having regard to the design, strength, material of construction and proposed use of the article, has:

- (a) determined the safe working load of the article; and
- (b) marked the safe working load and associated information on the article, in accordance with this Order.

27 SWL standards

In determining the safe working load of an article of material handling equipment, a competent person must comply with:

- (a) the relevant Australian Standard; or
- (b) an equivalent national standard established by a signatory member body of:
 - (i) the International Organization for Standardization; or

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- (ii) for electrical equipment — an affiliate body of the International Electrotechnical Commission.

28 Maximum load

- 28.1 An article of material handling equipment must not be used to handle a load exceeding the safe working load of the equipment, for loading or unloading a ship, except in accordance with Schedule 6.
- 28.2 The mass of any loose gear, spreader, equalising beam and other cargo gear attached to the lifting appliance is to be taken into account in calculating the load on lifting appliances.

29 Testing, thorough examination, inspection and certification

- 29.1 Each item of material handling equipment and each sling or lifting device forming an integral part of a load must be of good design and construction and comply with the provisions of Schedules 5, 7, 8 and 10 that apply to the type of equipment.
- 29.2 Material handling equipment must not be used for loading or unloading unless:
- (a) it has been tested, thoroughly examined, certificated and inspected, in accordance with Schedule 4; and
 - (b) the current record of examination and inspection in the register of material handling equipment indicates that the equipment is fit for use; and
 - (c) it is visually examined before being used, to confirm it is free of obvious defects and is fit for that use.
- 29.3 If material handling equipment has been tested and examined in accordance with Schedule 4 and the competent person considers that it is satisfactory, he or she must issue a certificate in accordance with the form for the test and examination set out in Schedule 11.
- 29.4 If material handling equipment has been examined or inspected in accordance with Schedule 4 and the competent person or the responsible person considers it satisfactory, that person must record the inspection in the materials handling equipment register.

Division 6 Certificates of test and the register of material handling equipment**30 Register requirements**

- 30.1 The master of a ship must keep on the ship an up-to-date register of material handling equipment for ship equipment.
- This is a penal provision.
- 30.2 The owner of each item of shore equipment must keep an up-to-date register of material handling equipment for that equipment at the place where it is normally stored.

This is a penal provision.

Section 31

- 30.3 A competent person or responsible person who supervises or carries out tests, thorough examinations, inspections, heat treatment or any maintenance, repair or replacement of material handling equipment to which this Order applies must record particulars of the work in the applicable register of material handling equipment.

This is a penal provision.

- 30.4 A register of material handling equipment may be kept in any convenient form subject to the following conditions:
- (a) the register must contain the information required by this order;
 - (b) each entry must be clearly legible;
 - (c) each entry must be authenticated by the competent or responsible person supervising or carrying out the work mentioned in subsection 30.3.

Note A form of register is available on the AMSA website at <http://www.amsa.gov.au>.

31 Certificate requirements

- 31.1 A certificate of test of material handling equipment manufactured in Australia must be in the form specified for the equipment in Schedule 11.

Note Forms of certificate are available on the AMSA website at <http://www.amsa.gov.au>.

- 31.2 A certificate of test for material handling equipment manufactured in a country other than Australia and tested or thoroughly examined in a country other than Australia by a competent person, will be acceptable as a certificate of test for this Order if the certificate contains information substantially equivalent to that required by the forms mentioned in Schedule 11.

- 31.3 If an original certificate is not available, a certified copy is acceptable for subsections 31.1 and 31.2.

- 31.4 A requirement of subsection 31.1 or 31.2 to provide a certificate of test for wire rope or chain, if that equipment is a portion only of a greater manufactured length, may be met by producing a certified copy of the certificate issued by, or for, the manufacturer of the greater length of wire, rope or chain.

32 Availability of certificates and register

- 32.1 All certificates of test and inspection, that are:

- (a) current for equipment to which this Order applies; and
- (b) required by this Order to be kept, made available or given to a duty surveyor;

must be kept with, or near at hand to, the register of material handling equipment.

- 32.2 The master of a ship must make the register of material handling equipment and the certificates for ship board equipment readily available for inspection by a surveyor on request.

This is a penal provision.

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- 32.3 The owner of shore equipment being used for loading or unloading a ship must make the register of material handling equipment and any certificates issued by a competent person under this Order readily available for inspection by a surveyor on request.

This is a penal provision.

Division 7 Maintenance and repair of ships' material handling equipment

33 General

Material handling equipment, mechanical ventilation equipment, lighting and other equipment used in loading and unloading must at all times be properly maintained by the operator of the ship.

34 Ship machinery

The master of a ship must not allow ship machinery to supply power to material handling equipment or other equipment being used in or in relation to loading or unloading if there are not sufficient qualified persons to maintain the engineering watch to comply with the ship's minimum safe manning certificate issued under Regulation V/14 of SOLAS.

35 Safety arrangements

- 35.1 If maintenance or repair work is carried out during loading or unloading, the person in charge must ensure that all persons are reasonably protected against accidental injury arising from the maintenance or repair work.

- 35.2 The person in charge must:

- (a) assess the danger in the maintenance or repair work; and
- (b) take into account the presence or likely presence of noxious gases, fumes, dust, radiation, excessive noise or other nuisance that could obstruct, interfere with or distract a person engaged in the loading or unloading.

36 Repairs to material handling equipment

A person must not carry out repair work on material handling equipment if the person is not:

- (a) competent in the repair of that kind of equipment; and
- (b) equipped to perform the repair.

This is a penal provision.

37 Heat treatment

- 37.1 The person in charge, the master of the ship or the terminal operator must not permit the use in loading or unloading of a chain, ring, hook, shackle, swivel, connecting plate or overhauling weight that is subject to stress unless it has been examined by a competent person to determine if heat treatment is necessary.

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- 37.2 If heat treatment is necessary, it must be applied under the supervision of a competent person to a process appropriate to its design and material to restore the mechanical properties of the material or to relieve any stress.

38 Verification

- 38.1 The person in charge, the master of the ship or the terminal operator must not permit the use of repaired material handling equipment before it has been tested and thoroughly examined in accordance with Schedule 4 if the repair is not:
- (a) the normal periodic replacement of an individual component by a component having the same technical specification; or
 - (b) a repair to a non stress bearing component.
- 38.2 Repaired material handling equipment must not be used until:
- (a) it is certified safe to use, in accordance with Schedule 4; or
 - (b) for a repair mentioned in paragraph 38.1 (a) or (b):
 - (i) a thorough examination is carried out by a competent person or a responsible person; and
 - (ii) the repair and examination are recorded in the register of material handling equipment.

39 Transitional

- 39.1 A test or examination conducted under Issue 1 or 2 of this Order is taken to be a test, thorough examination or inspection conducted in accordance with this Order.
- 39.2 A certificate issued under or recognised for Issue 1 or 2 of this Order is to be taken to be a certificate issued under this Order.
- 39.3 For a ship built before 1 January 2015, if any of provisions 6(b), 8.3(b), 10, 14.1.2, 14.2.1(a), 14.4.2, 14.4.3, 14.5.1, 14.5.3(d) and 15.2.3 of Schedule 2 cannot be complied with because of the design or construction of the ship, those provisions need not be complied with if corresponding provisions of Issue 2 of this Order are complied with.

Schedule 1 Dock work safety

(section 22, subsections 23.3 and 23.6)

1 Safe atmosphere

- 1.1 The operator and master of a ship must take precautions to prevent access by persons to a space that may have an unsafe atmosphere.
- 1.2 A space in a ship that is to be entered for loading or unloading must have been adequately ventilated before entry is permitted.
- 1.3 If there is any doubt about an acceptable level of hazard, the advice of a competent chemist should be obtained and the space tested for oxygen deficiency and levels of toxic and other airborne contaminants, taking into account that:
 - (a) these should be measured against the currently accepted exposure standards for those contaminants specified in the table of exposure standards in "Guidance Note on the Interpretation of Exposure Standards for Atmospheric Contaminants in the Occupational Environment" (NOHSC: 3008(1995) 3rd Edition); and
 - (b) for some contaminants, such as benzene and asbestos, any positive level of contamination is unacceptable.
- 1.4 A cargo hold may not provide a safe atmosphere and appropriate atmospheric testing at periodic intervals may be required to ensure that an acceptable level of risk is maintained.
- 1.5 Additional precautions to be taken where a mechanical stowing appliance is used in an enclosed space are specified in clause 4 of this Schedule.
- 1.6 Appropriate and reasonable precautions must be taken by the operator or master of a ship to prevent access by persons to a space that has been fumigated until the atmosphere in that space has been determined to be safe.

Note Recommendations on appropriate safety measures to be taken when using pesticides on ships are to be found in the Supplement to the IMDG Code. Other authorities, such as port authorities, may have additional requirements that must be met.
- 1.7 Where the safety of the atmosphere may be reduced as a result of cargo operations, such as in a ro-ro vehicle deck, the master should ensure that ventilation machinery is operating.

2 Lighting

Loading or unloading must not be carried out unless:

- (a) there is provided suitable deck and under-deck illumination, with a minimum level of:
 - (i) 10 lux on access routes; and
 - (ii) 20 lux on ladders that provide access to the ship, accommodation ladders and gangways; and

- (iii) 50 lux in working areas onboard and adjacent to the ship, taking into account any specific need that may require additional illumination; and
- (b) the level of light in adjacent areas is reasonably uniform; and
- (c) any artificial illumination employed does not endanger the health or safety of persons engaged in loading or unloading, or the safety of the ship or of the cargo; and
- (d) any artificial illumination employed is so arranged that glare and dazzle is minimised and the formation of heavy shadow that may conceal a danger in cargo handling or access is prevented.

Note For the meaning of *illumination* — see section 6. Additional guidance on measuring illumination is contained in Australian Standard AS 1680.

3 Protective fencing

3.1 Open hatchways

3.1.1 An open hatchway must be securely fenced to a height of 1 m in accordance with subclause 3.6, unless:

- (a) the hatchway is entirely surrounded by coamings to a height of at least 750 mm; or
- (b) the hatchway is otherwise inaccessible.

3.1.2 The intermediate rail specified in paragraph 3.6(a) is not required if the hatch coaming is between 400 mm and 750 mm in height.

3.1.3 Fencing is not required for the side of a hatchway where suitable fencing is fitted between the hatchway corners and the side of the ship.

3.2 Upper decks

3.2.1 Loading or unloading must not be carried out unless all upper decks to which persons have access for loading or unloading are securely fenced on each outer edge with a bulwark or guardrails to a height of at least 1 m above the deck and are so designed, constructed and placed as to prevent a person from accidentally falling overboard.

3.2.2 Bulwarks or guardrails for subclause 3.2.1 must be continuous except that sections may be removed for a loading or unloading operation to the minimum extent necessary for that purpose.

3.2.3 Except as specified elsewhere in this Order, access to a cargo working area in or on a ship, including hold accesses, crane or winch operating positions or any other location required to be occupied by persons engaged in loading or unloading, must afford a minimum passageway width of 550 mm.

3.3 Deck cargo

Where cargo or material handling equipment is stowed on the upper decks of a ship, loading or unloading must not be carried out, unless:

- (a) if the cargo is stowed adjacent to a bulwark, guardrail or hatch coaming in a position where any person requires access for loading or unloading, and the bulwark, rail or hatch coaming is not of sufficient height to prevent such person from falling overboard or into an open hold, temporary fencing complying with subclause 3.6 of this Schedule is provided; and
- (b) safe access is provided to any winch, crane or any other location required to be occupied by persons engaged in loading or unloading, such access:
 - (i) having a surface as level and compact as is practicable; and
 - (ii) being provided with appropriate steps or ladders at changes of level; and
 - (iii) being guarded as necessary by temporary fencing.

3.4 Cargo spaces

- 3.4.1 Loading or unloading must not be carried out in a cargo space where there is a risk of a person falling a distance of 2 m or more, unless fencing in accordance with subclause 3.6 is installed to prevent a person falling.
- 3.4.2 Where 2 lifting appliances are operating in the same cargo space, with work being carried out at different levels, a net or other equivalent protection must be rigged in such a manner as to prevent persons and cargo falling from the upper level.
- 3.4.3 Loading or unloading must not be carried out using a mechanical stowing appliance in any cargo space where an unprotected opening exists into which the appliance could fall.

3.5 Machinery moving parts

- 3.5.1 Moving parts of machinery, steam pipes and live electrical conductors in and adjacent to areas on a ship where loading or unloading is being carried out must be so guarded, fenced or otherwise enclosed as to prevent accidental access, except where such part, pipe or conductor, by virtue of its position or construction, presents no risk of injury to a person or damage to property.
- 3.5.2 Removal of guards around machinery, including parts of mechanical stowing appliances, mechanised hatch covers or other power operated equipment, steam pipes, electrical conductors or the like must only be done by a person authorised by the master, and only after that person has advised the person in charge of such intended action.
- 3.5.3 Where such guards are removed, adequate precautions must be taken by the person removing the guard to ensure the safety of persons in the vicinity. The person in charge must not require or permit unauthorised persons under his or her control to approach the area where the guard has been removed until advised by a person authorised by the master that it is safe to do so.

3.5.4 Where a safety device is removed or rendered inoperative, measures must be taken by the person removing the device or rendering it inoperative to ensure that the relevant equipment cannot be used, except as required by this Order, or inadvertently started, until the device has been replaced or its operation restored.

3.6 Temporary fencing

Temporary fencing, for this Schedule, must:

- (a) comprise at least 2 parallel rails, ropes or chains, the top rail, rope or chain being at a height of at least 1 m above and substantially parallel to the walking surface, and the intermediate rail, rope or chain being about midway between the top rail, rope or chain and the walking surface; and
- (b) if constructed of rope or chain, be provided with means for keeping the rope or chain as taut as is practicable; and
- (c) be continuous except that a section may be removable for the purpose of loading or unloading to the minimum extent necessary for that purpose; and
- (d) where enclosing a hatchway, be supported by metal stanchions spaced not more than 2.5 m apart, which, if fitted into sockets in the deck, must be equipped with a securing device ensuring that each stanchion remains in position.

4 Mechanical stowing appliances and other vehicles

4.1 For use in cargo spaces

A mechanical stowing appliance or other vehicle powered by an internal combustion engine must not be used in a cargo space during loading or unloading unless that cargo space is provided with natural or mechanical ventilation that is adequate to prevent the accumulation of harmful concentrations of gases, fumes and vapour.

4.2 For use in handling dangerous goods

A reference to a Class of Dangerous Goods includes any dangerous goods required to carry a subsidiary risk label relating to that class.

4.2.1 Class 1

4.2.1.1 In relation to class 1 dangerous goods, under deck stowage requirements which are category II—type A (Magazine), a mechanical stowing appliance or other vehicle must not be used:

- (a) in handling such goods; or
- (b) in a cargo space in which such goods are stowed unless stowed in accordance with the IMDG Code and the stowage magazine is securely closed.

4.2.1.2 In relation to class 1 dangerous goods, other than those referred to in subclause 4.2.1.1, an unpowered mechanical stowing appliance may be used in loading and unloading, provided that in the case of goods of compatibility group A, J or L, the forks or tines of the appliance must be made of or coated with spark

resistant material, ensuring that frictional sparks cannot be generated by those surfaces of the appliance.

- 4.2.1.3 In relation to class 1 dangerous goods of division 1.2, compatibility group B, or goods specified by the IMDG Code to be of compatibility group J or L, a powered mechanical stowing appliance must not be used in loading or unloading, other than a fork lift vehicle having:
- (a) motive power provided by batteries carried on the vehicle, that can be overridden by a manual control; and
 - (b) solid-state electronic controls for all functions including traction, hoisting, side lift and mast tilt (no resistance type controls); and
 - (c) traction power transmitted by mechanical gearing to the front wheels of the vehicle; and
 - (d) hoist, side shift and mast tilt power transmitted by hydraulic means enabling the vehicle to travel and hoist simultaneously; and
 - (e) pneumatic or semi-pneumatic rubber tyres complying with the relevant standards specified by the Tyre and Rim Association of Australia Standards Manual as applying at the date of commencement of this Order, at least 2 of the tyres being electrically conductive with a resistance of not less than 5×10^4 ohms and not more than 25×10^4 ohms when measured between the wheel hub and a conductive plate on which the wheel rests; and
 - (f) single metal wheels, the configuration being 4 on a rectangular base; or
 - (g) power-assisted steering pivoting the rear wheels which are to be remote from the load; and
 - (h) pedal hydraulic brakes and a separate parking brake, all complying with clause 13 of Australian Standard AS 1915; and
 - (i) all electrical equipment including controls and lights, protected in compliance with International Protection 64 (IP64) of Australian Standard AS 1939; and

Note For the operational environment of the vehicle, see Standard AS/NZ 4745-2004, definition of *class II hazardous area*.

- (j) a normal operating temperature not exceeding 135°C (temp T4) in an ambient temperature of 40°C when tested in accordance with clause 15 of Australian Standard AS 1915; and

Note Ignition temperatures for flammable liquids, gases and volatile solids are given in NFPA publication 325M which is available for inspection at Standards Australia libraries at Sydney and Melbourne.

- (k) the following durable and conspicuous markings:
 - (i) identification of manufacturer or Australian agent;
 - (ii) temperature class as determined in accordance with Australian Standard AS 1915;
 - (iii) hazardous area classification as determined in accordance with Australian Standard AS 2430.1;

(iv) gross mass of the vehicle;

(v) safe working load;

and complying with the following provisions of Australian Standard AS 1915:

(l) clause 8 — battery and battery container;

(m) clause 9 — plug and socket connectors;

(n) clause 10 — electrical protection;

(o) clause 11 — cabling.

4.2.1.4 In relation to class 1 dangerous goods specified by the IMDG Code to be division 1.1 or division 1.2 goods of compatibility group D, or division 1.3, 1.4 or 1.5 goods other than those of compatibility groups J or L, a fork lift vehicle powered by batteries carried on the vehicle may be used in loading or unloading provided the vehicle complies with Australian Standard AS 2359.1 for a class II hazardous area.

4.2.1.5 A powered mechanical stowing appliance carrying class 1 dangerous goods in a ship must be operated only on electrically conductive surfaces to ensure continuous earthing of the appliance.

4.2.1.6 Subclauses 4.2.1.3, 4.2.1.4 and 4.2.1.5 do not apply in relation to the loading or unloading of class 1 dangerous goods packed in a cargo transport unit.

4.2.1.7 Freight containers packed with Dangerous Goods of Class 1, other than those in division 1.4 Compatibility Group S, must not be lifted by means of tyne pockets.

4.2.2 Class 2, 3, 4, 5 and 9

4.2.2.1 A cargo space containing goods of classes 2.1 or 3, except where such goods are contained in a closed CTU, as defined in the IMDG Code, is considered to be a Zone 1 hazardous area. A powered mechanical stowing appliance must not be operated in such an area unless it complies with Australian Standard AS 2359.1 for a Zone 1 hazardous area.

Note The IMDG Code defines a closed CTU as a unit that totally encloses the contents by permanent structures. Cargo transport units with fabric sides or tops are not closed CTUs.

4.2.2.2 Subject to subclause 4.3, a powered mechanical stowing appliance must not be used in loading and unloading dangerous goods of classes 4, 5 and 9, other than dangerous goods of classes 4.3 and 5.2, unless the appliance complies with Australian Standard AS 2359.1 for a class II hazardous area.

4.3 Ship equipment

A mechanical stowing appliance that is ship equipment for loading and unloading must:

(a) be of good design and construction and of adequate strength for its intended use; and

(b) comply with an appropriate national or international standard; and

(c) be provided with a manual, in English, that is available to the person in charge that specifies the performance criteria of the appliance and the safety

and maintenance procedures for its proper operation, unless a competent person has certified that the appliance meets criteria that will ensure its safe operation and that certificate is made available to the person in charge; and

- (d) be fit for use and maintained in accordance with the manufacturer's requirements and at intervals specified by that manufacturer, with a record of such servicing being kept on board the ship; and
- (e) have a spark arrester fitted on the exhaust of an internal combustion engine; and
- (f) have bare heated surfaces of the engine or motor that are liable to ignite spilled fuel suitably protected; and
- (g) carry a suitable fire extinguisher; and
- (h) be fitted with an effective:
 - (i) service brake; and
 - (ii) parking brake; and
- (i) where the appliance is fitted with more than 1 operating position, have all appropriate controls for operating the appliance provided at each position; and
- (j) except where prevented by low headroom, be equipped with overhead guards to prevent injury to the driver from falling objects; and
- (k) have its safe working load marked on it in a durable and readily visible manner; and
- (l) be provided with means for promptly cutting off power in an emergency.

4.4 Inertia precautions

4.4.1 When a mechanical stowing appliance is not in use or is unattended:

- (a) the engine or motor must be stopped, the brake applied or the wheels blocked, forks (if fitted), fully lowered and, if possible, operating controls locked; and
- (b) the appliance must be so positioned as to not obstruct a passageway or access.

4.4.2 When cargo is being placed upon, or removed from, a powered truck or trailer truck that is a mechanical appliance used in connection with loading or unloading, the truck must be secured against movement by the application of brakes or the blocking of wheels.

4.5 Warning signs for ramps

4.5.1 Where a laden mechanical stowing appliance is required to travel down a ramp with a grade in excess of 8%, warning signs must be placed at the top of the ramp to warn the operator of the appliance of the risks.

4.5.2 The warning signs must require the driver to engage low gear, and must indicate the steepness of the gradient.

5 Motors in cargo spaces

5.1 General

An internal combustion engine, except an engine in a vehicle carried as cargo, or an electric motor on a mechanical stowing appliance or on an appliance used for loading and unloading, must not be operated in a cargo space during loading or unloading unless it is in good order and condition and complies with section 9.1.7 of the ILO Code.

5.2 Fire precautions

An internal combustion engine or an electric motor must not be used in a cargo space in connection with loading or unloading, unless there is provided in that space a fire extinguisher suitable for extinguishing a fire in the engine or motor, designed, tested and marked:

- (a) in the case of a foam type fire extinguisher, in accordance with Australian Standard AS 1841.1 and AS 1841.4; or
- (b) in the case of a carbon dioxide type fire extinguisher, in accordance with Australian Standard AS 1841.1 and AS 1841.6; or
- (c) in the case of a vaporising liquid fire extinguisher, in accordance with Australian Standard AS 1841.1 and AS 1841.7; or
- (d) in the case of a dry powder type fire extinguisher, in accordance with that part of Australian Standard AS 1841.1 and AS 1841.5 that relates to an extinguisher in which a mixture of dry powder and expellant is stored under pressure,

or in the case of a ship registered in a country other than Australia, a suitable fire extinguisher of a standard equivalent to (a), (b), (c) or (d), as appropriate.

5.3 Fuelling

5.3.1 An internal combustion engine of a mechanical stowing appliance or other vehicle for use in loading or unloading, must not be fuelled in a cargo space unless:

- (a) the fuel has a flashpoint of 43°C or greater; or
- (b) the fuel is contained in a cylinder designed to be attached to the appliance or vehicle and directly coupled to its fuel system.

5.3.2 A petrol engined vehicle, being part of the cargo of the ship that is intended to be driven off the ship under its own power, must not be fuelled in a cargo space unless:

- (a) the method of fuelling is such that the likelihood of spillage is minimised; and
- (b) the amount of fuel transferred to the vehicle is not more than 5 litres; and
- (c) not more than 2 vehicles are concurrently fuelled in the space.

6 Opening and closing of mechanically operated hatch covers

Any person, including masters and stevedores, associated with the operation of mechanical, hydraulic or electrically powered hatch covers must comply with the following safety precautions:

- (a) persons in the vicinity of hatch covers must:
 - (i) be warned when the hatch covers are about to be opened or closed; and
 - (ii) be instructed to withdraw to a safe position and remain clear of moving hatch covers;
- (b) no hatch covers may be opened before all persons are clear and there are no loose objects on the covers;
- (c) no person is to be permitted on any hatch cover, whether closed or retracted, when it is about to be opened or closed;
- (d) no person is to be permitted on top of a retracted back-folding hatch cover unless the preventer chains or other securing devices are in position.

7 Communication

The person-in-charge must ensure that:

- (a) the driver of a crane or derrick; and
 - (b) any person required to communicate with the driver,
- are fully conversant with the method of communication to be used during the cargo handling operation.

Note Section 5.4 of the ILO Code deals with signals and signalling.

Schedule 2 Dock worker access while on board

(subsections 23.5 and 39.3)

1 Requirement for access

Loading or unloading must not be carried out in a cargo space, the depth of which, measured from the level of the uppermost deck of the space to the bottom of the space, exceeds 1.5 m, unless:

- (a) at least 1 unobstructed and safe means of access complying with this Order is maintained from the uppermost deck of the space to the level at which such loading or unloading is to take place; or
- (b) where the access specified in (a) is unavoidably obstructed by cargo, safe access is provided by 1 portable ladder complying with this Schedule.

2 Access to include opening and ladder

A means of access must include an access opening and an adjacent permanent ladder, both situated clear of the hatchway through which cargo is loaded or unloaded, and be located so that a person using the means of access will not enter the operating area directly below the cargo hatchway.

3 Size of access etc

An access opening must be:

- (a) arranged to give an opening clear of all obstructions of not less than 600 mm by 600 mm within the coaming and continuing to the deck or platform below on an axis parallel to the ladder, provided that on a ship built before 1 August 1998, the clear opening must be not less than 550 mm by 550 mm; and
- (b) where necessary, provided with fittings so arranged and located adjacent to the opening, as to afford a secure handhold and foothold to persons using the opening.

4 Cover to access to be capable of being secured open

A cover or closing appliance fitted to an access opening must be so arranged as to be capable of being secured in the open position.

5 Access in bulk carriers

- 5.1 Bulk cargo must not be loaded into or unloaded from a cargo space unless means are provided enabling persons to escape from that space in case of emergency.
- 5.2 In a bulk carrier, a cargo space requiring personnel access for the purpose of loading or unloading must be provided with:
 - (a) a means of access complying with subclauses 13.1 and 14.3 of this Schedule; and

-
- (b) in the case of a ship built on or after 17 November 1986, a second means of access that:
- (i) may be an inclined ladder complying with subclauses 13.1 and 14.3; or
 - (ii) may be formed, regardless of the depth of the cargo space, from a series of staggered vertical ladders complying with subclause 14.2 linking platforms complying with subclause 14.5 of this Schedule.

6 Access in cellular container ships

In a cellular container ship, only 1 means of access to a cargo space is required. This may be formed, regardless of the depth of the cargo space, from a series of staggered vertical ladders, complying with subclause 14.2, fitted between adjacent transverse webs or stringers which serve as working platforms or passageways within the cargo space, provided that:

- (a) no ladder exceeds 6 m in length; and
- (b) the passageways between ladders are not less than 600 mm in width.

7 Access in other types of ships

A cargo space in a ship built on or after 1 August 1998, other than a ship used exclusively as a bulk carrier or as a cellular container ship, must be provided with at least 2 means of access. Where possible, these should be arranged diagonally within the hold, separated as far apart longitudinally, and as far apart athwartships, as possible. One such means of access must be maintained in compliance with clause 1 of this Schedule at all times during loading or unloading. A ship built before 1 August 1998 may alternatively comply with subclause 6.2 of Schedule 7 of Issue 1 or Issue 2 of this Order.

8 Access to containers onboard for loading or unloading

- 8.1 Access provided to or near the top of a container or barge stowed on a ship for loading or unloading must be by means of:
- (a) a fixed walkway; or
 - (b) a personnel cradle complying with Schedule 3; or
 - (c) a portable ladder complying with subclause 13.2 of this Schedule, except that where extension of the ladder beyond the work level is impractical, the ladder need not so extend nor need the ladder be secured at its upper resting position provided that the ladder is held steady while it is being used; or
 - (d) by other means affording equivalent safety.
- 8.2 A scissor-lift or elevating platform that complies with subclause 14.5.3 of this Schedule may be used for access to the top of a container or shipborne barge if:
- (a) it stands on a firm surface; and
 - (b) in the elevated position it provides stable access; and
 - (c) it has means of preventing involuntary vertical or horizontal movement.
- 8.3 Where securing devices, such as lashing bars, lashing wires and rigging screws, are to be manually attached to, or removed from, stacks of containers stowed on

a ship, the space provided between the container stows for workers to carry out lashing operations should provide:

- (a) a firm and level working surface; and
- (b) a working area, excluding lashings in place, not less than 750 mm wide, to provide a clear sight of twistlock handles and allow for the manipulation of lashing gear; and
- (c) sufficient space to permit the lashing gear and other equipment to be stowed without causing a trip hazard; and
- (d) sufficient space between the fixing points of the lashing bars on deck, or on the hatch covers, to tighten the turnbuckles; and
- (e) access in the form of simple ladders on hatch coamings and with safe access to lashing platforms; and
- (f) protective fencing on lashing platforms; and
- (g) adequate lighting in line with this Order.

Note for paragraph (b) It is recommended that, within the working area, a clear space free of all obstructions, including lashings, be provided with a width of at least 550 mm.

- 8.4 Where the stow of containers extends to the side of the ship, and the Cargo Securing Manual requires that the containers at the side of the ship be secured by lashing devices such as lashing bars, lashing wires and rigging screws, a platform with dimensions, clear of all lashing points, which should be not less than 550 mm by 550 mm, must be provided extending to the side of the ship at a height convenient for the persons required to secure or release the lashing devices.
- 8.5 In all cases, access walkways, ladders and lashing platforms must be fit for purpose with all dockwork able to be safely undertaken from within the safety and confines of the equipment fitted.
- 8.6 Toe boards, that are at least 100mm high, must be provided around the sides of lashing platforms, except in the way of ladders.
- 8.7 Container lashing devices must be uniform and compatible. Twistlock types must be kept to the minimum and must be provided with clear instructions, in English and in the working language of the ship, for their use.
- 8.8 Dedicated bins for faulty or damaged gear must be provided and appropriately marked.

9 Coamings

- 9.1 Where a coaming exceeding 450 mm in height above the deck surface is fitted to an access opening, steps, cleats or rungs must be fitted inside the coaming to form a continuation of the access ladder:
 - (a) to within 450 mm from the top of the coaming; and
 - (b) providing a foothold:
 - (i) not less than 300 mm in width; and

- (ii) with tread depth in the case of a step, and a clearance from the coaming in the case of a rung or cleat, of not less than 150 mm;
 - (c) spaced at equal intervals corresponding to the steps or rungs of the access ladder; and
 - (d) so constructed as to prevent slipping.
- 9.2 Where a coaming exceeds 900 mm in height above the deck, steps or cleats must be provided outside the coaming suitable for use by a person climbing over the coaming to enter or leave the hatch.

10 Passageways

Where a means of access to a cargo space includes a passageway, other than a passageway referred to in paragraph 6(b) of this Schedule, such passageway must have a vertical clearance of 2 m and a width of 750 mm except that, in entrance doorways and openings through structural members such as bulkheads or web-frames, width may be reduced to 600 mm and the vertical clearance may be reduced by the height of any sill. Such sill must not be more than 450 mm in height.

11 Hatchway covers and hatchway beams

- 11.1 A ship equipped with hatchway covers that are not mechanically operated must not be loaded or unloaded unless:
- (a) it is provided with cargo gear suitable for removing and replacing beams supporting hatchway covers, other than sliding or rolling beams, without the need for a person to stand on a beam; and
 - (b) except where all the hatchway covers of that part of the ship are interchangeable, each hatchway cover is plainly marked to indicate the deck and hatchway to which the cover belongs and its position on the hatchway; and
 - (c) hatchway covers and hatchway beams are in good condition and are well fitting and secure when in position; and
 - (d) each hatchway cover that is intended to be lifted by hand, is fitted with handgrips appropriate to the size and weight of the cover and of sufficient size to provide an adequate hand grip; and
 - (e) each hatchway cover, other than those intended to be lifted by hand, is provided with safe means for removal and replacement; and
 - (f) each hatchway cover or hatchway beam when correctly positioned in the hatchway is of such fit that any horizontal movement in the direction of its length will not result in it overlapping its end supports by less than 65 mm in the case of a hatchway cover and 75 mm in the case of a hatchway beam.
- 11.2 Cargo operations must not be conducted through a hatchway which has been only partially uncovered unless:
- (a) sufficient hatchway covers and hatchway beams have been removed to allow cargo to pass through the opening without risk of striking the remaining covers or beams; and

-
- (b) beams or covers adjacent to the opening are effectively secured to prevent accidental dislodgment.
- 11.3 A hatchway cover must not be used in the construction of a cargo stage or platform or for any purpose other than the covering of a hatchway.
- 11.4 A hatchway cover, hatchway beam or tarpaulin removed from a hatchway must:
- (a) be so placed or secured that it cannot fall into the hold if dislodged; and
 - (b) if placed on the uppermost deck, be so positioned that there is at least 1 continuous safe walkway of at least 750 mm in width in a fore and aft direction and a similar walkway in an athwartships direction from the hatchway to the side of the ship over which cargo is being loaded or unloaded; and
 - (c) subject to subclause 11.5, if placed on a deck, be so positioned that there is a space of at least 750 mm between the hatchway cover, beam or tarpaulin and the hatchway.
- 11.5 If the structure of the ship or the stowage of cargo makes compliance with paragraph 11.4(c) impracticable, fencing or safety lines must be rigged in such manner that persons engaged in cargo operations or handling hatchway covers or beams can work in safety.
- 11.6 Cargo operations must not be conducted through a hatchway fitted with mechanically operated hatchway covers, unless the covers are effectively secured in the stowed position.
- 11.7 A mechanical stowing appliance must not be operated on a hatchway cover unless the cover is of sufficient strength or is sufficiently reinforced as to support the axle loading of the appliance when engaged in handling cargo.
- 11.8 Cargo must not be loaded onto a hatchway cover unless the cover is of sufficient strength or is sufficiently reinforced to support that cargo.

12 Cargo stages and platforms

A cargo stage or platform constructed for use in the cargo operations of a ship must not be used unless it is:

- (a) of substantial construction, adequately supported and, where necessary, securely fastened; and
- (b) of a size sufficient for the intended purpose; and
- (c) provided with fencing in accordance with clause 3 of Schedule 1 on each side not used for receiving or delivering cargo, except where the height of the stage or platform does not exceed 1.5 m above the deck or where access is required; and
- (d) provided with a safe means of access including, where necessary, a ladder; and
- (e) provided with a surface affording a safe foothold for persons on it; and

-
- (f) fixed in a substantially horizontal plane that provides a safe working surface in the event that a mechanical stowing appliance is intended to be operated on it.

13 Ladders — general

13.1 Permanent ladders

- 13.1.1 The permanent ladder adjacent to an access opening must be:
- (a) where the vertical distance between the upper surface of adjacent decks separated vertically or between deck and the bottom of the cargo space is not more than 6 m, either a vertical ladder (on which the upper end must extend at least 1000 mm above the opening to which it provides access) or an inclined ladder complying with this Schedule; and
 - (b) where the vertical distance between the upper surfaces of adjacent decks separated vertically or between deck and the bottom of the cargo space is more than 6 m, an inclined ladder or ladders complying with this Schedule; and
 - (c) so designed and arranged that the risk of damage from the cargo loading or discharging gear is minimised.
- 13.1.2 In ships not having a 'tween deck, the uppermost 2.5 m of a cargo space measured clear of overhead obstructions, and the lowest 6 m of a cargo space may have vertical ladders complying with this Schedule, providing the vertical extent of the inclined ladder or ladders connecting the vertical ladders is not less than 2.5 m.

13.2 Portable ladders

- 13.2.1 Where a portable ladder is provided for access to a cargo space through a hatchway, the following requirements apply:
- (a) safe passage must be provided from the deck to the hatch coaming;
 - (b) safe and unobstructed passage must be provided across the coaming;
 - (c) where a coaming is of such a width that a secure hand grasp cannot be obtained, adequate handholds must be provided at the top of the coaming.
- 13.2.2 Where a portable ladder is in use in a hatchway as a means of access, no cargo may be loaded or unloaded through that hatchway and no material handling equipment may be operated in or at that part of the space served by the ladder when any person is on or about to mount the ladder.
- 13.2.3 A portable ladder must not be used by persons engaged in loading or unloading a ship, unless it is:
- (a) of substantial construction, made in 1 continuous length without means of extension and in good condition; and
 - (b) not more than 6.5 m in length; and
 - (c) placed on a firm and level surface and so positioned that it has a slope of between 70° and 80° to the horizontal; and

- (d) secured at its upper resting position, which position should be at least 1 m below the top of the ladder: alternatively the ladder must be held steady while it is being used.
- 13.2.4 For subclause 13.2.3, a timber portable ladder designed and constructed in accordance with Standard AS/NZS 1892.1, or a metal ladder complying with Standard AS/NZS 1892.1, is suitable.

14 Ladder design

14.1 General

- 14.1.1 A permanently fitted ladder must not be used for access to a cargo space by persons required for loading or unloading of that space or for access to a crane unless the ladder is designed and constructed in accordance with sound engineering principles, it substantially complies with the requirements of this Schedule and it is fit for use.
- 14.1.2 A clear area complying with subclause 14.5 of this Schedule must be provided at the top and bottom of each section of a permanent ladder.

14.2 Vertical ladders

- 14.2.1 The following requirements apply to a vertical ladder:
- (a) the inclination of the ladder to the horizontal must exceed 65° except that, in way of sloping ends of holds in a bulk carrier, the ladder may be at a lesser angle to the horizontal for a length of ladder not exceeding 6 m;
 - (b) the rungs must be spaced at equal intervals of not more than 350 mm and not less than 250 mm and provide a foothold for a width of not less than 300 mm;
 - (c) the rungs of the ladder must be formed from solid metal bars having:
 - (i) a circular cross section, or
 - (ii) a square cross section with one diagonal vertical;
 - (d) the rungs must be as follows:
 - (i) bars of a circular cross section having a minimum diameter of 25 mm;
or
 - (ii) bars of a square cross section having sides of a minimum of 22 mm;
 - (e) the ladder must provide a secure handhold;
 - (f) the side rails of the ladder must be in a vertical plane.
- 14.2.2 On ships built after 1 August 1998, the maximum vertical length between platforms of a vertical ladder outside a cargo space (for example in a crane pedestal) is 6 m.

14.3 Inclined ladders

14.3.1 The following requirements apply to an inclined ladder:

- (a) the ladder must be inclined at an angle to the horizontal not greater than 65°;
- (b) the steps of the ladder must be spaced at equal intervals of not more than 350 mm and not less than 250 mm and provide a foothold for a width of not less than 450 mm;
- (c) the steps of the ladder must be formed from chequered steel plate, with the leading edge rounded, or a satisfactory equivalent or from solid metal bars having:
 - (i) a circular cross section; or
 - (ii) a square cross section with one diagonal vertical;
- (d) the steps must be as follows:
 - (i) steel plate or the like having a bearing surface of not less than 115 mm in depth; or
 - (ii) bars of a circular cross section having a minimum diameter of 25 mm; or
 - (iii) bars of a square cross section having sides of a minimum of 22 mm;
- (e) the steps, if constructed of metal bars, must consist of 2 or more parallel bars arranged on the same horizontal plane, with the distance between the centres of adjacent bars being not less than 65 mm and not more than 75 mm;
- (f) if, on a ship built before 1 August 1998, the steps of an inclined ladder do not meet the requirements of paragraph (e), the ladder may continue to be used if the gap between adjacent bars of any step does not exceed 50 mm;

Note Any replacement ladder would have to meet the requirements of paragraph (e).

- (g) the side rails of the ladder must be in a vertical plane;
- (h) the ladder must be fitted on each side with:
 - (i) a metal handrail of not less than 25 mm diameter; or
 - (ii) a suitably tensioned steel wire rope of not less than 8 mm diameter encased in PVC tubing of not less than 25 mm diameter, substantially supported so that the handrail is parallel to the ladder through points measured 1 m vertically above the centre of the steps, the horizontal distance separating the handrails being not less than 550 mm and not more than 750 mm.

14.3.2 An inclined ladder may be arranged in the form of a spiral stairway and must comply with subclause 14.3.1, except that:

- (a) the depth of tread at mid-width of each step must be an arc of at least 150 mm and concentric with the perimeter of the spiral stairway; and
- (b) 1 rail only, on the outer perimeter of the spiral, need be fitted.

14.4 Clearances

- 14.4.1 A ladder must have clearances that enable a person to use it with safety.
- 14.4.2 Access space in front of the rungs of a vertical ladder should normally be a clear space of 760 mm by 760 mm, with no obstructions intruding into the space. It is recognised, however, that the ship's structure may not always permit these clearances in a trunked accessway. In no case, however, should the clearance be reduced below 600 mm by 600 mm. If there are obstructions (such as stiffeners or deck plates protruding into the clear space) reducing clearance to less than 650 mm from the ladder to the opposite wall, the protrusion should be plated over or otherwise protected. Similarly, lamp fittings in a trunked accessway should be sited in corners only, with minimum possible projection. Clearances behind the ladder should be at least 150 mm from the centre of the tread or the rung. At least 75 mm should be provided for hand clearance on each side of the ladder and around vertical hand grips.
- 14.4.3 Access space in front of the rungs of an inclined ladder should be not less than 1850 mm measured vertically above the centre of each step. At least 75mm should be provided around the hand rails for hand clearance. There should be a gap of 35 mm behind the tread to minimise build up of material that may impair the foothold.

14.5 Landing platforms

- 14.5.1 Landing platforms must comply with this Schedule and be spaced not more than 6 m apart vertically on vertical or inclined ladders, except where a spiral stairway is provided. On vertical ladders, they must be fitted so that the upper end of each section of ladder extends at least 1000 mm above, and provides access to, a platform displaced to 1 side of the ladder. Hand grips in line with the ladder rungs, and at the same spacing, or a pair of vertical hand grips in line with the ladder stiles, may be provided in lieu of the ladder extension above the level of the platform.
- Note* Hand grips, or additional hand grips, may be displaced to 1 side of the ladder stiles where this will assist persons transferring from ladder to platform or vice versa.
- 14.5.2 A landing platform complying with subclause 14.5.1 must be provided where there is a change in slope or a change in alignment of adjacent sections of a permanent ladder, other than in the lowest 6 m of the cargo space or where any section of a ladder terminates at a working deck or bottom of the space. For the purposes of this provision, **working deck** means a deck in a space where cargo is designed to be stowed or handled.
- 14.5.3 A landing platform must:
- (a) provide a minimum area of 750 mm by 750 mm:
 - (i) measured in the horizontal plane, clear of ladders and obstructions, such as the opening arrangement of any door or hatch; and
 - (ii) that must be increased if necessary if a door opening onto a platform would unduly restrict the available space; and

- (b) be fitted with a rigid handrail at a height of 1 m above the platform surface and an intermediate rail about midway between the top rail and the platform on each side, except in way of a ladder; and
- (c) have a surface of a non-slip construction; and
- (d) except in way of a ladder, be fitted with a toe board extending to a height of not less than 100 mm vertically above the walking surface around the periphery of the platform; and
- (e) have a head clearance of not less than 2 metres measured vertically above the surface of the platform.

Note For ships built before 1 January 2015, refer to section 39.

15 Crane operator's cabin and access

15.1 Crane operator's cabin

A crane, other than a crane fitted with remote controls in accordance with subclause 3.6 of Schedule 7, must not be used in loading or unloading unless, where the crane is provided with a cabin, the cabin:

- (a) provides the operator with a clear and unrestricted view of the load and area of operation or of a hatchman from the operating position of the crane; and
- (b) for any window that normally affords the operator a view of the load and area of operation or of a hatchman from the operating position of the crane — has a device that effectively clears rain or moisture ; and
- (c) affords the operator ready access to the operating position and to all necessary controls and switches; and
- (d) is adequately heated in cold weather by means that do not emit noxious or objectionable fumes; and
- (e) is adequately ventilated by mechanical means; and
- (f) is equipped with a suitable seat and, where necessary, footrests;
- (g) if fitted with an access door, allows the door to be operated from both inside and outside the cabin, has an opening at least 550 mm wide and 1850 mm high (including any sill, the height of which must not exceed 450 mm), and, where the door is of a type which may become so obstructed as to prevent rescue in case of emergency, allows access to the cabin through a second opening; and
- (h) is constructed of fire-proof materials; and
- (i) in the case of an electrically operated crane or a crane in which electrical equipment connected with the crane's operation is installed, contains a suitable fire extinguisher complying with the appropriate Australian Standard or equivalent; and
- (j) has been so designed that noise and vibration remain within acceptable limits; and
- (k) shields the operating position and seat from the effects of radiated heat from the driving mechanism; and

- (l) if the crane is capable of hoisting a load to the level of the operating position — has any window that is at risk of being struck by a swinging load fitted with laminated glass, toughened safety glass or a material offering equivalent protection; and
- (m) is provided with illumination operable from the control position.

15.2 Access to crane operating position

15.2.1 Access to the operating position of a crane must be provided by means of:

- (a) a spiral stairway ladder complying with subclause 14.3.2 of this Schedule; or
- (b) an inclined ladder or ladders complying with subclause 14.3.1 of this Schedule; or
- (c) a vertical ladder or ladders complying with subclause 14.2 of this Schedule; or
- (d) any combination of paragraph (a), (b) or (c).

15.2.2 The top of any access opening in a crane pedestal must be at least 1850 mm above the deck. If a sill is fitted, it must not exceed 450 mm in height. The clear width of the opening must be at least 550 mm.

15.2.3 Where access is installed inside the structure of the crane or crane pedestal, a means of emergency escape not less than 550 mm by 550 mm that allows descent to a safe surface in any position the crane may stop must be provided outside the structure unless:

- (a) there is no machinery sited in the access way and the access route is provided with lighting; and
- (b) any electrical wiring in the access way, other than for light fittings, is contained in sealed metal conduit; and
- (c) any electrical equipment in the access way is contained in properly secured metal boxes.

Example 1

An appropriate safe escape provision may be considered to include any of the following:

- (a) fixed ladders in conjunction with platforms or landings;
- (b) fixed rungs with a landing ledge, together with handrail, leading to a vertical ladder;
- (c) a wire rope ladder, permanently secured at its upper end, that when deployed allows descent to a safe surface from any position at which the crane may stop;
- (d) controlled descent devices, or other emergency escape devices, that:
 - (i) comply with relevant AS or international standards; and
 - (ii) are subject to a documented regular inspection and testing regime carried out and controlled under the vessel's Safety Management System; and
 - (iii) have instructions, in English and easily legible, for their use displayed where the equipment is to be used; and
 - (iv) have maintenance records available to the person in charge or a surveyor on request.

Example 2

Electrical equipment may be considered to be properly secured in a metal box if it is necessary to use a screwdriver, spanner or special tool to open the box.

- 15.2.4 Instructions for use of the means of escape must be provided.
- 15.2.5 A vertical external access ladder, other than an emergency escape ladder, that is:
- (a) of a height exceeding 3 m; or
 - (b) of any length if the crane can be located so that a person using the ladder could fall into a cargo space, overboard or onto a deck lower than that on which the ladder originates;
- must be fitted with a ladder cage which would substantially prevent such a fall, unless the ship's structure provides equivalent protection.
- 15.2.6 For subclause 15.2.5, a ladder cage should consist of cage hoops and longitudinal strips, of adequate strength, fitted substantially in accordance with the following specifications:
- (a) cage hoops uniformly spaced at intervals not exceeding 900 mm, so that:
 - (i) either:
 - (A) where the top of the ladder terminates at the edge of a platform or deck, the topmost cage hoop is attached to the upper guard-rail; or
 - (B) where the top of the ladder terminates at an access opening in a platform or deck, the topmost cage hoop is fitted just below the level of the platform, except that where the cage longitudinals are secured to the platform or deck, the topmost hoop may be sited not more than 900 mm below the platform or deck; and
 - (ii) the lowest cage hoop is located not less than 2 m and not more than 2.2 m above the deck or platform adjacent to the base of the ladder;
 - (b) cage longitudinals, secured to the cage hoops, suitably spaced to prevent a person falling away from the ladder;
 - (c) a rear half of the cage approximately semi-circular in shape;
 - (d) a minimum clear internal width of 550 mm and a maximum clearance between the ladder rungs and the back of the cage of 750 mm;
 - (e) does not hinder use of the ladder rungs or handholds.
- 15.2.7 A platform on a crane must be adequate for the purpose and, except as provided by subclause 15.2.9, must comply with this Schedule.
- 15.2.8 If a ladder gives access to a crane through an opening in a platform on the crane:
- (a) the ladder stringers must extend at least 1 m above the floor level of the platform or handgrips must be provided to that height; and
 - (b) the end of each stringer must be provided with adequate lateral support; and
 - (c) the top step or rung of the ladder must not exceed 1 tread pitch below the floor of the platform.

- 15.2.9 A walkway or platform providing access around or along a crane must:
- (a) have a minimum breadth of 550 mm; and
 - (b) provide safe access to and from the crane at any operating angle of luff or slew of the crane.
- 15.2.10 A ladder giving access to the operator's position of a crane must not be located in relation to any access opening in the floor of a platform or walkway such that the ladder, in the stowed position of the jib or the normal parked position of the crane, is positioned over the opening.
- 15.2.11 An internal access opening to a crane cabin must have:
- (a) if the access is from a machinery space — a fire and smoke resistant hinged cover or door; and
 - (b) if the access is through the floor but not from a machinery space — a hinged cover.
- 15.2.12 Subclause 15.2.11 applies to cranes installed on ships built after 11 August 1997, and to all cranes when an existing cover is replaced.
- 15.2.13 Subclauses 15.2.1, 15.2.2, 15.2.5, 15.2.6, 15.2.7, 15.2.8, 15.2.10, 15.2.11 and 15.2.12 do not apply to derrick cranes. Subclauses 15.2.3 and 15.2.9 apply to derrick cranes so far as their application may be relevant and practical.
- 15.2.14 A crane installed on a ship before 17 November 1986 must comply with subclauses 15.2.3 to 15.2.10 inclusive so far as is technically practicable taking into account the ship's structural arrangements.

15.3 Weather protection

A winch must be provided with adequate weather protection for the driver at the operating position.

Schedule 3 Personnel cradle

ILO Code, section 3.6.2.9

(Schedule 2, clause 8)

1 Construction

- 1.1 A personnel cradle must not be used for the carriage of a person in loading or unloading a ship, unless it:
- (a) is enclosed on all sides to a height of not less than 1 m above the surface of the interior floor by fencing and a gate or gates; and
 - (b) has at least 2 gates separated as widely as practicable from each other, except that a cradle designed to be handled by a crane of a type referred to in paragraph 2(b) need have one gate only; and
 - (c) is attached to a fall, or lifting frame at 4 points, by shackles, safety hooks or twist locks with a secondary means of attachment, in a manner that will prevent accidental disconnection; and
 - (d) has handholds inside the cradle fencing; and
 - (e) is permanently marked, on each side, with its designed gross operating mass; and
 - (f) is fitted with suitable bins, hooks or other arrangements to safely stow equipment normally carried in the cage.
- 1.2 For this Schedule, fencing must be of sheeting material or wire netting attached to stanchions and rails. The floor must be of solid construction of sheeting material or close fitting timber. The fencing and floor must provide sufficient strength to support twice the total mass of persons and equipment the cradle is designed to accommodate.
- 1.3 For this Schedule, a gate must be so designed and fitted as to:
- (a) provide safe passage to and from the personnel cradle; and
 - (b) be capable of being securely closed, in a manner that maintains the continuity of strength of the stanchions and rails referred to in subclause 1.2; and
 - (c) open only inwards and are self-closing; and
 - (d) be capable of being locked shut to prevent accidental opening.

2 Suitable crane

A personnel cradle containing a person may be hoisted or lowered only by means of:

- (a) a gantry crane using mechanically-operated locks, pins or similar devices controlled from the operator's cabin, provided the attitude taken up by the personnel cradle, on lifting, is such that the angle between the horizontal

plane and the plane of the floor of the personnel cradle does not exceed 5° for any condition of loading; or

- (b) any other crane complying with the other requirements of this Order, provided:
 - (i) that hoisting, lowering, luffing and slewing of the crane is under the control of a competent crane driver at all times and a safe speed is maintained during each of these operations; and
 - (ii) that the crane is fitted with motion-limiting devices, that automatically interrupt operating power and hold the crane and its load stationary in the event of failure of operating controls for hoisting, lowering, luffing or slewing; and
 - (iii) that the crane is fitted with a clearly identified emergency stop control, situated in a readily accessible position which, when activated, interrupts the operating power so that the hoisting, lowering, luffing and slewing machinery is held stationary; and
 - (iv) that, unless the crane has been in use for loading or unloading immediately prior to hoisting a personnel cradle, it is demonstrated to be safe for the purpose by hoisting a load at least equal to twice the designed gross operating mass of the cradle.

3 Procedure

The following requirements apply to the hoisting or lowering of a personnel cradle by a crane referred to in paragraph 2(b):

- (a) each person in the cradle must be provided with a suitable safety harness and safety lines;
- (b) if necessary, means must be provided to restrain the cradle from spinning or swinging while suspended;
- (c) there must be direct visual communication between the crane driver and personnel in the cradle or other equally effective means of communication;
- (d) where the operating machinery has more than 1 gear setting, the lowest speed gear must be engaged;
- (e) the crane must be so operated that:
 - (i) steady motion is achieved; and
 - (ii) the cradle floor is maintained in a substantially horizontal plane;
- (f) unless the crane is fitted with an effective 'dead man' control system that automatically stops crane operation in the event of the crane driver becoming incapacitated, a second driver must be stationed in or near the driving control cabin ready to take over the controls in an emergency;
- (g) a competent driver must remain at the crane controls at all times while the cradle is suspended or occupied by a person or persons.

Schedule 4 Test and thorough examination procedures for material handling equipment

(subsections 11.2, 29.2, 38.1 and 38.2)

1 Items other than wire and fibre ropes, nets and slings

- 1.1 Material handling equipment for use in loading or unloading a ship must be tested and thoroughly examined by a competent person in accordance with this Order:
 - (a) before being put into use for the first time; and
 - (b) following renewal or repair of any stress bearing part, except when the renewal is pursuant to a routine maintenance schedule.
- 1.2 In addition to the requirements of subclause 1.1, and subject to subclauses 1.3, 1.5, and 1.6, material handling equipment for use in loading or unloading a ship must subsequently:
 - (a) be tested and thoroughly examined in accordance with this Schedule by a competent person at intervals not exceeding 5 years; and
 - (b) be thoroughly examined at intervals not exceeding 12 months by:
 - (i) in the case of equipment under survey with a classification society — a competent person; and
 - (ii) in any other case — a responsible person.
- 1.3 Paragraph 1.2(a) does not apply to loose gear except where specific provision is made in subclause 1.7, 1.8 or 1.9.
- 1.4 Items of equipment permanently attached to a lifting appliance, including lower cargo blocks, ponder balls and cargo hooks dedicated to use with a specific lifting appliance and forming part of the assembly, need not be separately tested at the 5 yearly testing of the lifting appliance to which they are attached.
- 1.5 In relation to ship equipment, a thorough examination required by subparagraph 1.2(b)(i) may be postponed, for a period of not more than 3 months, if the postponement will enable the examination to be carried out with a scheduled annual Class survey of the ship, provided that a responsible person carries out a thorough examination at the due date, and if the equipment is found satisfactory, has endorsed the register of material handling equipment.
- 1.6 If the design of specialised material handling equipment or heavy lift equipment is such that, in the opinion of a competent person, the equipment cannot reasonably be tested or retested in the manner specified in this Schedule, or the equipment would require unnecessary dismantling, the periodic test and thorough examinations required by subclause 1.2 may be dispensed with, provided that:
 - (a) the manufacturer's equipment specification, schedule of examination and maintenance manual are available to the competent person; and

- (b) examination and maintenance procedures have been carried out in compliance with the manual and recorded in the appropriate register by a competent or responsible person; and
 - (c) the equipment is fit for use.
- 1.7 Subclauses 1.1 and 1.2 do not apply to an intermediate bulk container having permanently attached fittings for handling, provided that its design and construction conforms to a container that has been type tested in accordance with clause 9 of this Schedule.
- 1.8 Subclauses 1.1 and 1.2 do not apply to a mechanical stowing appliance:
- (a) being shore equipment; or
 - (b) being ship equipment for use solely in or on the ship, provided the appliance complies with subclause 4.3 of Schedule 1.
- 1.9 Subclauses 1.1 and 1.2 do not apply to a specialised cargo handling system being:
- (a) shore equipment; or
 - (b) ship equipment for use solely in or on the ship and there is on board details of the manner by which the safe working load has been established, a description of the method by which cargo should be handled and details of any limitations on the use of the equipment or any of its component parts.

2 Cranes and derricks

2.1 Proof load

- 2.1.1 Where a crane or derrick is tested, the proof load must not be less than the applicable load specified in Table 1, except that where a hydraulic crane is tested in accordance with paragraph 1.1(b) or 1.2(a) of this Schedule, and it is not practical for the crane to raise the full test load, a reduced test load may be accepted but in no case is this to be less than the SWL x 1.1.

Table 1

SWL of derrick gear or crane (tonnes)	Proof load
Not more than 20	SWL x 1.25
More than 20 but not more than 50	SWL + 5 tonnes
More than 50	SWL x 1.1

- 2.1.2 Where derricks in union purchase are tested, the proof load specified in Table 1 must be based on the SWL of the derricks when rigged in union purchase, as stated on the drawing or drawings specified by subsection 25.1 of this Order.
- 2.1.3 For a test of a crane or derrick, the load imposed on any accessory block, topping lift, shackle, preventer, guy or other accessory part must not exceed the SWL of that part by more than the proportion by which the proof load exceeds the SWL of the crane or derrick.

2.2 Application of proof load

- 2.2.1 The proof load for a test of a crane (including a derrick crane), derricks in union purchase and the initial test of a derrick must be applied by hoisting movable weights.
- 2.2.2 The proof load for a test of a derrick or derrick crane, following renewal of a part or repair, must be applied by hoisting movable weights, or by means of a spring or hydraulic balance or similar appliance.
- 2.2.3 The proof load must be applied:
- (a) with the derrick boom or crane jib at its minimum working angle (or load radius in the case of a crane or derrick crane), measured from the horizontal plane and stated in the certificate of test; or
 - (b) in the case of a variable length jib crane, with the jib at its maximum and minimum operating lengths, stated in the certificate of test, and at a length approximately midway between maximum and minimum.

2.3 Structural test with movable weights

Where a crane or derrick is tested with movable weights, after the movable weights are hoisted:

- (a) the crane or derrick must be swung at slow speed to the extremities of its slewing arc; and
- (b) in the case of a jib crane with a travelling capability, the crane must be moved the entire length of its travelling track at slow speed with the jib extended to the maximum working outreach perpendicular to its direction of travel on one side of its travelling track, and again, with the jib similarly extended to the other side; and
- (c) in the case of a bridge or gantry crane with a travelling capability, the crane must be moved the entire length of its travelling track with the hoist at one extremity of the traversing span, and again, with the hoist at the other extremity; and
- (d) in the case of a bridge or gantry crane without a travelling capability, the crane must be made to move the weights from one extremity of its traversing span to the other; and
- (e) in the case of a derrick crane, in addition to paragraph (a), the derrick crane is to be luffed at slow speed to its maximum operating angle measured from the horizontal plane, then returned at slow speed to its minimum operating angle.

2.4 Structural test with spring or hydraulic balance

Where a derrick or crane is tested with a spring or hydraulic balance, or similar appliance, the proof load must be applied, for a period of not less than 5 minutes, at the minimum working angle at each extremity of its working arc and in its midship position.

2.5 Operational test of crane

A crane must undergo an operational test, including testing of its limit switches, by hoisting a load at least equal to the SWL while carrying out all motions occurring in normal operations, such as hoisting, luffing, slewing and travelling, using its full range of speeds. All brakes must be tested in accordance with subclause 3.3 of this Schedule.

2.6 Structural test of derrick gear in union purchase

For the purpose of testing derrick gear in union purchase, the proof load must be manoeuvred throughout the working range of the gear, rigged over one side of the ship and hoisted to a level that:

- (a) makes the angle between the runners close to, but not in excess of, 120°, or
- (b) such lesser angle as is specified in the drawing or drawings specified in Schedule 7,

and again, with the gear rigged over the opposite side of the ship.

2.7 Thorough examination

Following testing of a crane or derrick, the crane or derrick and all accessory gear must be thoroughly examined by a competent person for damage or permanent deformity, and overload limit switches reset.

3 Winches

3.1 Span gear winches

If a derrick is fitted with a span gear winch, the winch must be tested while the derrick is supporting the proof load at its lowest working angle by in turn subjecting each sprocket to the resultant load.

3.2 Topping and main winches

On completion of the tests with the proof load, each winch must be tested with a load equal to the SWL suspended from the derrick head, and the derrick placed in various positions such that each winch serving the derrick is subjected to loading while having the maximum working length of rope layers upon its drum.

3.3 Brake test of winches

After completion of the proof load tests of a derrick, a load equal to the SWL for that derrick is to be hoisted then, with the derrick slewed outboard to each side of the ship and with the derrick amidships, lowered at the normal lowering speed of the winch for a distance of approximately 3 m. The winch is then to be braked sharply and the load brought to a halt. It is then to be demonstrated that a load equal to the SWL of the derrick can be held stationary by the winch brake when the winch drive is switched off.

4 Cargo lifts and mechanical ramps

4.1 Proof load

Where a cargo lift or mechanical ramp is tested, the proof load must be not less than the applicable load specified in Table 2.

Table 2

SWL of lift or ramp (tonnes)	Proof load
Not more than 20	SWL x 1.25
More than 20 but not more than 50	SWL + 5 tonnes
More than 50	SWL x 1.1

4.2 Application of proof load

For the purpose of testing, a cargo lift or mechanical ramp must be hoisted and lowered through its full range of travel with the proof load consisting of movable weights distributed in accordance with the designed operating requirements.

4.3 Thorough examination

Following testing, a cargo lift or mechanical ramp and its accessory gear must be thoroughly examined by a competent person for damage or permanent defects.

5 Blocks, chains, rings, hooks, shackles, swivels, connecting plates, overhauling weights

5.1 Proof load for single sheave block

The proof load for a single sheave block is 4 times the block's SWL.

5.2 Method of application of proof load for single sheave block

The block is to be suspended head down by a wire (or chain in the case of a chain block) passing around its sheave. A mass equal to 4 times the SWL is to be secured to the block's head fitting, and lifted from the ground. The test may be carried out in any other manner provided that the same stress is applied to the block. Where a single sheave block is provided with a becket, the test must be done with a part of the supporting wire secured to the becket, to avoid overstressing the sheave or pin.

5.3 Proof load for multiple sheave block

5.3.1 Where a multiple sheave block is tested, the proof load must be not less than the applicable load specified in Table 3.

Table 3

SWL of block (tonnes)	Proof load
Not more than 25	SWL x 2.0
More than 25 but not more than 160	(SWL x 0.933) + 27 tonnes
More than 160	SWL x 1.1

5.3.2 The multiple sheave block is to be rove in its normal operating condition and the proof load is to be applied to the head fitting of the block to be tested. Testing of a multiple sheave block normally requires the use of a second block or an equivalent arrangement for the rope.

5.4 Proof load for chain, etc

Where a chain, ring, hook, shackle, swivel, connecting plate or overhauling weight is tested, the proof load must be not less than the applicable load specified in Table 4.

Table 4

SWL of article (tonnes)	Proof load
Not more than 25	SWL x 2
More than 25	(SWL x 1.22) + 20 tonnes

5.5 Other articles

Hand operated blocks used with pitched chains, their associated chains, and any permanently attached rings, hooks, swivels and associated shackles must be subjected to a proof load not less than SWL x 1.5, unless tested in conjunction with the articles referred to in subclause 5.1, 5.3 or 5.4.

5.6 Thorough examination

Following testing of an article referred to in subclause 5.1, 5.3, 5.4 or 5.5, the article must be thoroughly examined by a competent person for permanent deformation, cracks, flaws or other defects including, in the case of a block, the head fitting, sheave or sheaves, axle, crosshead, becket and other parts.

6 **Trays, crates, tubs, grabs, scrap bins, other receptacles for loading or unloading cargo, and personnel cradles**

6.1 Proof load

Where a personnel cradle, tray, crate, tub, grab or other receptacle for use in loading or unloading cargo other than a container or returnable cargo unit referred to in clause 9 or 10 of this Schedule is tested, the proof load must be not less than the applicable load specified in Table 5 and must be wholly supported by the bottom surface of the receptacle.

Table 5

SWL of article (tonnes)	Proof load
Not more than 3	SWL x 2
More than 3 but not more than 12	SWL + 3 tonnes
More than 12 but not more than 20	SWL x 1.25
More than 20	SWL + 5 tonnes

6.2 Thorough examination

Following testing of an article referred to in subclause 6.1, the article must be thoroughly examined by a competent person for permanent deformation or other damage or defects.

7 Lifting beams, spreaders, lifting frames, magnetic lifting devices and vacuum lifting devices

7.1 Proof load

Where a lifting beam, spreader, lifting frame, magnetic lifting device or vacuum lifting device is tested, the proof load must be not less than the applicable load specified in Table 6, and must be attached in the manner for which the article is designed.

Table 6

SWL of article (tonnes)	Proof load
Not more than 10	SWL x 2
More than 10 but not more than 160	(SWL x 1.04) + 9.6 tonnes
More than 160	SWL x 1.1

7.2 Thorough examination

Following testing of an article referred to in subclause 7.1, it must be thoroughly examined by a competent person for permanent deformation or other damage or defects.

8 Wire ropes and terminal or end fittings, fibre ropes and flat synthetic-webbing slings

8.1 Wire ropes — testing

- 8.1.1 Samples from wire rope as manufactured are to be tested to destruction in accordance with Australian Standard AS 3569 — Steel Wire Ropes, or other applicable national standard. Wire ropes supplied to ships for loading and unloading purposes, including topping lifts, preventers and standing rigging, are to be provided with a certificate.

- 8.1.2 The safe working load (*SWL*) specified in the certificate is to be calculated according to the following:

$$SWL = \frac{\text{minimum breaking tensile load of sample}}{\text{applicable safety factor}}$$

- 8.1.3 The applicable safety factor (*SF*) is to be not less than the figure obtained from the following formula:

$$SF = \frac{10\,000}{(SWL \times 8.85) + 1910}$$

provided that the safety factor need not exceed 5 for *SWL*s up to 10 tonnes weight, and must be at least 3 for *SWL*s of 160 tonnes weight and more.

8.2 Wire ropes — inspection

- 8.2.1 An inspection of wire ropes must be made by a responsible person at intervals not exceeding:

- (a) for a wire rope which does not pass over a sheave or a winding drum — 12 months; or
- (b) for a wire rope which passes over a sheave or winding drum — 6 months.

- 8.2.2 A wire rope may only be used if:

- (a) a competent person has issued a certificate in respect of the rope; and
- (b) a responsible person has inspected the rope, externally and, as far as practical, internally, in the period required by paragraph 8.2.1(a) or (b) immediately preceding the proposed use and found that the rope is not worn, corroded or otherwise defective to a degree that renders it unfit for the proposed use; and
- (c) the rope is free from knots and kinks; and
- (d) the rope complies with the structural requirements specified in Schedule 5; and
- (e) evidence, based on prototype testing, that any terminal or end fitting on the rope complies with subclause 8.3 of this Schedule is recorded in the appropriate register of material handling equipment.

- 8.2.3 If a wire rope with a broken constituent wire is to be used, the following requirements apply:

- (a) the rope must be inspected by a responsible person prior to its initial use, and at least monthly, to determine if the rope is fit for use; and
- (b) the responsible person must record the result of the inspection in the appropriate register of material handling equipment; and
- (c) the rope must not be used unless the responsible person has determined that the rope continues to be fit for use.

8.3 Terminal or end fittings

- 8.3.1 There must be on board evidence that a terminal connection fitted to a wire rope used for hoisting a load on a crane or derrick is of a design on which prototype tests have shown that the strength of the terminal and its attachment to the rope is not less than 95% of the minimum breaking load of the rope for a rope up to and including 50mm in diameter or 90% of the minimum breaking load of the rope for a rope exceeding 50mm in diameter.
- 8.3.2 Subclause 8.3.1 does not apply if the equipment is under survey and inspection pursuant to a scheme of classification and certification by a classification society.
- 8.3.3 A certificate specifying the type and size of terminal or end fitting, the type and size of wire rope to which it was fitted, and the result of the above test, is to be supplied with each such terminal or end fitting, or set of identical terminal or end fittings.

8.4 Fibre ropes

- 8.4.1 Samples from fibre rope as manufactured are to be tested to destruction in accordance with Australian Standard AS 4143.1 — Methods of Test for Fibre Ropes, or other applicable national standard. Fibre ropes supplied to ships for loading and unloading purposes, including topping lifts, preventers and standing rigging, are to be provided with a certificate.
- 8.4.2 The SWL specified in the certificate is to be calculated according to the following:

$$SWL = \frac{\text{minimum breaking tensile load of sample}}{\text{applicable safety factor}}$$

- 8.4.3 The applicable safety factor (*SF*) is to be not less than that given in table A1 of Australian Standard AS 4142.1 — Fibre Ropes Part 1: Care and Safe Usage.
- 8.4.4 Paragraphs 26(a) and (b) of this Order do not apply to fibre rope.

8.5 Flat synthetic-webbing slings

Material, design, manufacture, marking, testing and certification of flat synthetic-webbing slings must comply with the relevant Australian or equivalent international standards.

9 Intermediate bulk containers

The construction, marking, testing, inspection and certification of IBCs must be in accordance with the requirements of the IMDG Code.

10 Other returnable cargo units

- 10.1 Where a returnable cargo unit is type-tested, the proof load must be not less than SWL x 5.
- 10.2 A unit referred to in subclause 10.1 will pass the type-test if there is:
- (a) no loss of contents from the unit; and

(b) no breakage or serious deformation of the unit.

11 Nets and slings

Paragraphs 26(a) and (b) of this Order do not apply to nets and slings manufactured in accordance with Schedule 5.

Schedule 5 Requirements for material handling equipment

(subsection 29.1)

1 Chains

- 1.1 A chain must not be used in loading or unloading:
- (a) for slinging a heavy load of iron, steel or similar material, unless packing material is used to prevent:
 - (i) damage to the chain by reason of direct contact with any sharp edges of the load, or
 - (ii) slipping of the load by reason of a low coefficient of friction between chain and load; or
 - (b) if the chain is knotted.
- 1.2 Subparagraph 1.1(a)(ii) does not apply when chain slings are used in conjunction with a spreader bar so that the load is substantially horizontal when hoisted and the chains are manufactured from a higher tensile alloy steel such as chain designated as quality grade S or T in Australian Standard AS 2321.

2 Wire rope

- 2.1 A wire rope must not be used in loading or unloading, unless
- (a) in the case of a rope for use other than as a guy pendant, a preventer guy, a stay or a net or sling:
 - (i) it contains at least 114 constituent wires; and
 - (ii) any fibre material in its construction is strand or rope core only; and
 - (b) in the case of a runner or purchase, it comprises 1 continuous length without joins; and
 - (c) any thimble or loop splice fitted to the rope complies with Schedule 10; and
 - (d) it is free from knots or kinks.
- 2.2 Where a constituent wire in a rope is broken, that rope must not be used unless:
- (a) the rope has been inspected, in that condition, by a competent person within the period of 1 month immediately preceding that use; and
 - (b) the total number of visible broken constituent wires in a length of the rope equal to 10 times its diameter does not exceed 5% of the wires constituting the rope; and
 - (c) there is no more than 1 broken wire immediately adjacent to a compressed metal ferrule.
- Note* Section 5.3.3.3.3 of the ILO Code refers.
- 2.3 Wire rope grips may only be used in standing rigging, including attachment to the drum.

3 Slings and nets

- 3.1 Subject to subclause 3.2, a sling or net must not be used in loading or unloading unless:
- (a) it is made of chain, wire rope, woven synthetic webbings, woven steel webbings or fibre rope that complies with the requirements of this Order; and
 - (b) in the case of a sling other than an endless sling, it is fitted with eyes, rings, links or shackles that provide safe connection to a lifting hook; and
 - (c) the splices of the sling or net, being a sling or net of fibre rope construction, have at least 4 tucks of strands in each splice; and
 - (d) the sling or net is prevented by suitable means from being damaged by sharp edges on loads.
- 3.2 A sling or net that is an expendable or disposable sling must be discarded after use.

4 Hooks

- 4.1 A hook must not be used in loading and unloading unless the load is attached in a manner which precludes dislodgment during hoisting or lowering and:
- (a) the hook is of a construction and shape which prevents displacement of the load from the hook; or
 - (b) the hook is fitted with a device which prevents a load from becoming detached.
- 4.2 Subject to subclause 4.3, a hook must not be used in loading or unloading:
- (a) to hoist banded cargo, including cotton, wool, cork, gunny and other baled cargo, by means of the hook being applied directly to the strap or bands; or
 - (b) to hoist a drum or barrel by means of the hook being applied to the rim or a chine, unless the hook is of a suitable shape for that purpose and the construction and condition of the drum or barrel is such that hoisting may be carried out safely.
- 4.3 Subclause 4.2 does not apply:
- (a) in breaking out cargo from a stow; or
 - (b) in relation to a system of cargo handling in which metal bands or straps are used that are intended for use in hoisting the cargo, where the metal bands or straps are of adequate strength and:
 - (i) the cargo is handled in accordance with the manufacturer's specification and operating instructions; and
 - (ii) the system complies with Schedule 8 of this Order.

5 Lifting devices

- 5.1 A container lifting frame fitted with an arrangement of twist locks must not be used in loading or unloading unless:
- (a) a device is fitted that gives the driver of the hoisting crane or derrick or a hatchman, as appropriate, a visual indication of whether or not the twist locks are in the locked position; and
 - (b) where practicable, a device is fitted that prevents the frame, when attached to a container from being hoisted if any twist lock is not in the locked position.
- 5.2 A vacuum lifting device must not be used in loading or unloading unless:
- (a) it is fitted with a gauge or other instrument, clearly marked to indicate the least vacuum at which the device may be used with safety, that gives the driver of the hoisting crane or derrick or a hatchman, as appropriate, a visual indication of the state of the vacuum; and
 - (b) it is designed to automatically give an audible warning to the driver of the hoisting crane or derrick, the hatchman if any, and any other person in the vicinity, when the vacuum is 80% or less of its designed operating value or if the vacuum-inducing pump ceases to operate; and
 - (c) it is fitted with equipment that, in the event of failure of the vacuum-inducing pump, will maintain sufficient vacuum to support a suspended load equal to the safe working load of the device for a sufficient time for that load to be lowered from the maximum height of lift to a safe location.
- 5.3 A magnetic lifting device must not be used in loading or unloading, unless:
- (a) it is provided with an alternative power supply that comes into operation immediately in the event of failure of the main power; or
 - (b) only scrap metal or pig iron is being handled; or
 - (c) it is used for other cargo-handling operations of such a nature that there is no person in the vicinity other than the driver of the crane or derrick.

6 Intermediate bulk containers

- 6.1 An intermediate bulk container must not be used in loading or unloading unless:
- (a) all separable component parts of the lifting arrangements, if any, such as shackles or hooks, have been individually tested, examined and certificated; and
 - (b) if designed to be used once only, it has not previously carried cargo.
- 6.2 A container that is designed to be used once only may be filled and transported from the point of filling by 1 or more modes of transport to the point where it is emptied of its contents.
- 6.3 An intermediate bulk container must not be hoisted otherwise than in accordance with its designed lifting arrangement or by means of a cargo net or tray or other means giving adequate support.

7 Prescribed markings

7.1 Safe working load

An article of cargo gear must not be used in loading or unloading unless:

- (a) where the article is a block, chain or chain sling, ring, hook, shackle, swivel, clamp, pallet bar, connecting plate, multi-leg sling, synthetic webbing flat sling, round sling, can hook or similar article or an overhauling weight that is subject to stress, the safe working load is marked on it; and

Note The SWL marked on a multi-legged sling should be:

- (a) in the case of a two-legged sling, the SWL when the included angle between the legs is 90°; and
 - (b) in the case of a three-legged sling, the SWL when the included angle between any two legs is 90°; and
 - (c) in the case of a four-legged sling, the SWL when the included angle between any two diagonally opposite legs is 90°.
- (b) for a sling that is purpose-designed for a particular load — the safe working load for the sling in its designed operating alignment is marked; and
 - (c) where the article is a cargo tray, crate, tub, grab, scrap bin or other similar receptacle, or an intermediate bulk container, the safe working load for which the article has been tested is marked upon it; and
 - (d) where the article is a lifting beam, lifting frame or vacuum or magnetic lifting device, the safe working load for which the article has been tested and the tare mass of the complete article are marked upon it; and
 - (e) where the article is a personnel cradle, the safe working load for which it has been tested and the maximum number of persons, taken to be 82.5 kg each, it is designed to carry are marked upon it.

- 7.2 However, the safe working load does not have to be marked for natural fibre ropes and rope slings.

7.3 Distinguishing mark or number

- 7.3.1 An article of cargo gear intended for repeated use that is required to be marked with the safe working load, contents or load for which it has been tested, must be marked in a conspicuous place with an identification mark.

- 7.3.2 For subclause 7.3.1, an article of cargo gear may be identified by using a batch mark or number, where that mark is verified by a test certificate.

7.4 Method of marking

Marking of an article of cargo gear for any purpose of this Order must be done:

- (a) in a form that is durable; and
- (b) directly on the article in a place and in a manner that will not give rise to stress in the article, except that:
 - (i) where the material is too hard to accept marking; or

- (ii) direct marking would be likely to affect the safe use of the article;
the marking must be made on a tablet or disc permanently attached to the article.

Schedule 6 Safe use of material handling equipment

(subsection 28.1)

1 Maximum permissible load

- 1.1 Except when under test, and subject to subclauses 1.2, 1.3 and 1.4, an article of material handling equipment must not be subjected to a load greater than its SWL.
- 1.2 When a single sheave block is rigged as a double whip or gun tackle, so that the load is suspended from its head fitting, the load which may be lifted is twice the SWL marked on the block.
- 1.3 A crane or derrick may be used to hoist a load exceeding the SWL of the crane or derrick as an occasional lift, not in the course of normal operations, provided:
 - (a) the crane or derrick has a SWL of not more than 50 tonnes; and
 - (b) the crane or derrick has been inspected by a competent person who is satisfied that the crane or derrick and its associated equipment is fit to carry the excess load; and
 - (c) written permission of the master or owner in the case of ship equipment or the owner in the case of shore equipment has been obtained; and
 - (d) a duty surveyor has approved the handling of that occasional lift; and
 - (e) the load does not exceed the proof load for the crane or derrick gear.
- 1.4 In the case of equipment with a SWL of 50 tonnes or more, paragraphs 1.3(b) to (e) must be complied with and, in addition:
 - (a) the crane or derrick must be classed; and
 - (b) the classification society must concur with the overloading; and
 - (c) the method of loading must be such that the safety of the ship and persons on it would not be imperilled by breakage of any part of the equipment, including purchase or topping lift wires.

2 Use of two lifting appliances to lift a load

- 2.1 If a vessel's tandem crane arrangement is designed, tested and provided with manufacturers operating procedures for multiple crane lifting, the load to be lifted may not be more than the SWL designated for that arrangement.
- 2.2 If a vessel does not have in place the arrangement and manufacturers operating procedures required by subclause 2.1, only identical lifting appliances with safe operating procedures in place may be used, with the load to be lifted not exceeding the SWL of either appliance by 25%.

Note: The ILO Code, section 5.2.6, gives guidance.

3 Unsafe factors

An article of material handling equipment must not be rigged, reeved or used:

- (a) in such a manner or under such conditions as to involve risk of injury to persons or damage to property; or
- (b) if the article is in such deteriorated condition or is so damaged that it may be unsafe to use; or
- (c) otherwise than in accordance with this Order.

4 Suspended load

A load, other than, for example, a spreader or cargo lifting beam, must not be left suspended from, or supported by, a derrick, crane or mechanical stowing appliance unless, during the time it is suspended or supported, a qualified person is at the control position of the equipment engaged in the operation.

5 Monitoring cargo operations

- 5.1 Loading or unloading by means of a crane or derrick must not be carried out unless:
- (a) the driver has an unrestricted view of the load at all times during loading or unloading; or
 - (b) a hatchman is employed for each crane or set of derricks who is clearly visible to the driver or drivers.
- 5.2 Where persons are in a cargo space in connection with loading or unloading, whether or not a crane or derrick is being used, there must be a lookout who:
- (a) has a good view of the space; and
 - (b) is able to see potential dangers to the persons in the space; and
 - (c) is able to communicate with the persons in the space;
- and who must warn persons in the space of any perceived danger.

Note The cargo space lookout may be a person with other duties, such as a hatchman or the crane driver, provided that the person is capable of performing the duties assigned effectively.

- 5.3 Loading or unloading must not be carried out in a cargo space where 2 or more cranes or sets of derricks are working simultaneously and separately unless:
- (a) a separate hatchman is provided for each crane or set of derricks; and
 - (b) where work is to be carried out at different levels, a net or other equivalent protection is rigged in such manner as to prevent persons and cargo falling from the upper level; and
 - (c) each hatchman is provided with a safe operating area on deck at a location that affords adequate visibility for the hatchman to carry out his or her function.

6 Roll-on/roll-off operations

- 6.1 A ship must not be loaded or unloaded by the roll-on/roll-off method unless there is on board and available to the person in charge:
- (a) details of the maximum total load, the maximum axle loadings and maximum wheel loadings permitted on decks, internal ramps and cargo lifts; and
 - (b) an instruction manual, in English, for the ship's vehicular access ramp or ramps between the ship and the shore which includes the following data:
 - (i) permitted tidal variations, where appropriate;
 - (ii) allowable list and trim conditions for the ship;
 - (iii) the number and spacing of vehicles and maximum loadings for which the ramp is designed with details of vehicle weights, axle loadings, disposition of loads, tyre print dimensions and number and spacing of wheels; and
 - (c) details of the capabilities of mechanical stowing appliances that are ship equipment including their ability to negotiate ramps.
- 6.2 The person in charge must ensure that the criteria specified in the information required by paragraph 6.1(a), subparagraph (b)(iii) and paragraph (c) are not exceeded.
- 6.3 The master of a ship must ensure that the ship's vehicular access ramp is not used when tidal or list or trim conditions exceed the permitted limits.
- 6.4 An access ramp between ship and shore must not be used in roll-on/roll-off loading or unloading unless:
- (a) the surface of the ramp is:
 - (i) suitable for use by wheeled vehicles; and
 - (ii) of non-slip material or construction; and
 - (iii) kept clear of significant deposits of grease or oil spillage which may impair frictional resistance of the ramp surface; and
 - (b) the sides of the ramps are adequately protected to prevent a vehicle being driven over or otherwise falling from the edge of the ramp; and
 - (c) the ramp projects sufficiently, having regard to tidal and other movement, over the landing area on shore in the case of a shipborne ramp or over the landing area on the ship in the case of a shore operated ramp; and
 - (d) if a pedestrian access is provided on the ramp, it complies with Schedule 9 of *Marine Orders, Part 21 (Safety of navigation and emergency procedures)*; and
- Note* Refer to section 7.2.9 of the ILO Code.
- (e) where the access ramp is of a size permitting more than 1 lane of traffic, the direction for traffic flow in each lane is indicated; and
 - (f) except in the case of a ramp used only for the loading or unloading of motor vehicles, the slope of the ramp does not exceed a gradient of 1 in 10, unless

the person in charge is satisfied that mechanical stowing appliances used in loading or unloading the ship are capable of safely negotiating a steeper slope when laden provided the gradient does not exceed that specified in the operating instructions for the mechanical stowing appliances.

- 6.5 The operator of a mechanical stowing appliance manoeuvring at the stowage location of a load must be guided by another person whenever, due to the size or shape of the load, such guidance is necessary to ensure safety in handling.
- 6.6 The owner or master of a ship must ensure that any part of the ship's structure that could be an obstruction to vehicular traffic, such as stanchions and pillars, is made conspicuous by markings of sharply contrasting colours and, if necessary, adequately lit.

7 Cargo lifts and mechanical hoists

A cargo lift or mechanical hoist fitted in a ship must not be used in loading or unloading, unless it is provided with audible and visible warning signals that commence operation before the lift or hoist begins motion and continue to operate during motion.

8 Shipborne barges

A shipborne barge must not be loaded on or unloaded from a ship, unless it:

- (a) is constructed in accordance with the requirements of a survey authority or a classification society; and
- (b) is marked with its allowable stacking weight, tare weight and maximum permissible gross weight; and
- (c) has been examined in accordance with the inspection procedures specified by the survey authority or classification society.

9 Securing of shackles

A crane or derrick gear that is ship equipment, must not be used in loading or unloading unless shackles and other similar devices to be used with the crane or derrick gear that are situated aloft and are not readily accessible, are effectively secured against accidental dislodgment or release.

10 Dragging of a load

A load must not be dragged by means of a runner leading from a derrick or a crane if there is a risk that the SWL of any component of the derrick, crane or associated cargo gear would be exceeded.

Note The ILO Code, section 7.5.2, provides guidance.

11 Hoisting or lowering a person

Except in the case of access to a mobile offshore drilling unit or for the removal of an injured person from a cargo space, a person must not be hoisted or lowered in the course of cargo operations by means of a crane or derrick other than in a personnel cradle.

Note For the definition of **personnel cradle** — see section 6. For the requirements for a personnel cradle — see Schedule 3.

12 Use of wrought iron

An article of material handling equipment must not be used in loading or unloading if any part of that article that would support the load, either directly or indirectly, is made of wrought iron.

13 Use of grabs

A grab intended for use in loading or unloading bulk cargoes and which is to be attached to a ship's crane or derrick must be:

- (a) permanently marked with its tare mass, cubic capacity and SWL; and
- (b) suitable for the material to be loaded or unloaded; and
- (c) fit for use.

14 Pre-slung cargo

- 14.1 It is the responsibility of the shipper, stevedore or person carrying out the pre-slugging to ensure that, where slings are fitted to cargo ashore for the purpose of pre-slugging the cargo, the slings are in a fit state for use.
- 14.2 It is the responsibility of the person in charge to ensure that slings on pre-slung cargo comply with the requirements of this Order and that they are suitable and safe to use prior to loading and unloading.
- 14.3 Each person involved in the discharge of pre slung cargo must be vigilant in checking the condition of these slings during the unloading operation to detect damage that may have occurred during carriage.

Note 1 Where pre-slung cargo is lifted by specialised handling equipment, Schedule 8 also applies.

Note 2 Provision 3 of Schedule 5, dealing with slings and nets, applies to slings and nets used for pre-slung cargo.

Schedule 7 Requirements for lifting appliances

(subsection 29.1)

1 Requirements for derricks

1.1 Drawings and operational instructions

A derrick must not be used in loading or unloading unless the information specified in subsection 25.1 of this Order is readily available to the person in charge.

1.2 Use of stays

A derrick must not be used in loading or unloading unless all necessary stays, including backstays and preventer stays, to counteract loads on masts and derrick posts, other than stays such as shoulder stays necessarily disconnected to enable loading or unloading operations to proceed, are correctly fitted and kept taut and secure during loading and unloading.

1.3 Securing of guys in way of deck cargo

When deck cargo is stowed against and above a ship's rails or bulwarks, a wire rope pendant or a chain extending from a ring bolt or other anchorage on the ship must be provided:

- (a) of sufficient length to enable derrick guys and preventers to be attached without the need for a person engaged in loading or unloading to go overside; and
- (b) having a safe working load not less than the safe working load of the derrick guy or preventer with which it is to be associated.

1.4 Permanent attachments to a derrick

A derrick must not be used in loading or unloading unless all permanent attachments to the derrick, such as a ring bolt, eyebolt, padeye, lug, band or heel connection or fitting:

- (a) are of suitable material and construction; and
- (b) have strength appropriate to the maximum load which may be imposed on that attachment in accordance with the information specified in subclause 1.1.

1.5 Securing of guys to a derrick

For the purpose of loading or unloading, each guy, guy block, preventer guy or similar rope must be individually secured to a derrick at a permanent attachment complying with subclause 1.4, no more than 1 connection being made to each such attachment except that, in the case of a preventer guy, an eye that has been formed in 1 end by splicing may be placed around the derrick head in such manner that the eye is unlikely to be dislodged during loading or unloading.

1.6 Restriction of movement of heel blocks

Where a derrick heel block is subject to movement in the vertical plane between load and no-load positions, the derrick must not be used unless the block is fitted with a device constraining that movement consistent with safe operation.

1.7 Securing of runner

A runner must not be used in loading or unloading unless the end of the runner attached to the winch drum:

- (a) is effectively secured to the drum in a manner that will not damage any part of the runner; and
- (b) is secured otherwise than by means of fibre rope.

Note The method used to secure a runner to a winch should be by shackle or clamp-type socket or similar, any of which should provide a strength equivalent to 50% of that of the runner. The number of complete turns remaining on the drum of the winch when the complete working length of rope has been paid out should not be less than:

- (a) in the case of an ungrooved drum — 3; and
- (b) in the case of a grooved drum — 2.

1.8 Markings required

1.8.1 A derrick for use in loading or unloading must be marked with:

- (a) its safe working load for each operating condition in accordance with subclause 1.1; and
- (b) the lowest angle to the horizontal at which the derrick may safely be used, in accordance with subclause 1.1.

1.8.2 The marking of the safe working load or loads of a derrick must be:

- (a) where the derrick is to be used as a single derrick:
 - (i) the letters 'SWL' followed by numerals indicating the safe working load and letters identifying the units of mass in which the safe working load is expressed; and
 - (ii) where there is more than 1 operating condition, an oblique stroke separating the units of mass for each such condition.
- (b) where the derrick is to be used in union purchase rig:
 - (i) the letters 'SWL(u)' followed by numerals indicating the safe working load and letters identifying the units of mass in which the safe working load is expressed; and
 - (ii) where there is more than 1 operating condition in union purchase rig, an oblique stroke separating the units of mass for each such condition.

Note Examples of markings are:

- (a) 'SWL xt', 'SWL x/yt' .
- (b) 'SWL(u) xt', 'SWL(u) x/yt' .

1.8.3 Markings must be placed on the derrick or on a plate near the heel of the derrick and the letters and numerals must be not less than 77 mm in height, of

proportional breadth and must be of a light colour on a dark background or a dark colour on a light background.

1.9 Union purchase rig

Derricks must not be used in union purchase rig unless:

- (a) they are rigged in accordance with the drawings specified by subclause 1.1; and
- (b) each derrick is fitted with a preventer guy of wire rope, or wire rope coupled to a length of chain, having a safe working load commensurate with the stresses imposed on the derrick during loading and unloading; and
- (c) the guys used to position the derricks are kept taut during loading or unloading.

1.10 Angle between runners of union purchase rig

When loading or unloading by derricks in union purchase rig, the angle included by the ends of runners at the hook assembly measured in the plane of the runners must not be permitted to exceed 120° or such lesser angle as is specified in accordance with subclause 1.1.

2 Requirements for cranes

2.1 Drawings and operational instructions

A crane must not be used in loading or unloading unless the information specified in subsection 25.1 of this Order is readily available to the person in charge.

2.2 Limiting devices

- 2.2.1 Subject to subclauses 2.2.3 and 2.2.4, a crane used in loading or unloading must be provided with effective motion-limiting devices to prevent movement of the crane, and of a load being handled, beyond the designed range of operations of the crane.
- 2.2.2 A motion-limiting device must be so designed as to:
 - (a) be automatic in operation; and
 - (b) in the case of a crane other than a derrick crane, take effect by interrupting the operating power so that the crane and its load are held stationary.
- 2.2.3 A power-interrupting arrangement is acceptable on a derrick crane, but is not mandatory.
- 2.2.4 Subclause 2.2.1 does not apply to traversing, travelling or slewing motions of a crane installed before 17 November 1986, where compliance would be unreasonable or impracticable, but in such case, the crane must not be operated beyond its safe limits.
- 2.2.5 If a motion limiting device in accordance with subclause 2.2.1 is not provided on a derrick crane, the derrick crane must, where possible, be provided with other devices, which may include a visual or audible alarm, to warn the operator

that the derrick crane or load is approaching a limit of the designed range of operations of the crane or its load.

2.3 Markings required

- 2.3.1 A crane for use in loading or unloading must be marked with:
- (a) its safe working load; and
 - (b) where the safe working load varies with the outreach of the crane, the safe working load for each specified outreach.
- 2.3.2 The marking of the safe working load or loads and outreach of a crane or derrick crane must be:
- (a) numerals indicating the safe working load and letters identifying the units of mass in which the safe working load is expressed; and
 - (b) where paragraph 2.3.1(b) applies:
 - (i) numerals indicating the number of metres of outreach, followed by the letter 'm', and
 - (ii) an oblique stroke separating the information relating to each specified outreach.
- 2.3.3 Markings must, as appropriate, be placed conspicuously:
- (a) on:
 - (i) an external part of the structure of the crane; or
 - (ii) on the derrick crane or on a plate near the heel of the derrick crane; and
 - (b) in the driver's cabin within easy view of the driver.
- 2.3.4 External markings must be not less than 77 mm in height and of proportional breadth, and must be of a light colour if on a dark background, and of a dark colour if on a light background.
- 2.3.5 Where the safe working load varies with the outreach of the crane, means must be provided to enable the driver to ascertain the outreach of the crane at any time, and the corresponding safe working load.

2.4 Track-mounted cranes

- 2.4.1 A bridge or gantry crane must not be used in loading or unloading unless, in addition to the other applicable requirements of this Schedule:
- (a) it is so designed and constructed that it will not collapse or overturn in the event of breakage of a wheel, failure of an axle, or derailment; and
 - (b) it is fitted with locking devices or other means by which the crane can maintain its position when exposed to wind pressure; and
 - (c) it is fitted with tracks of adequate strength, properly laid, maintained in good condition and provided with stops at the ends of the trackways; and
 - (d) it is electrically bonded and earthed to the ship's structure; and
 - (e) locking devices on overside extensions are engaged; and

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- (f) where more than 1 crane is located on the same trackway, each crane is fitted with a device to prevent collision; and
 - (g) track wheels that are at deck level are fitted with foot guards;
- and the arrangements specified in subclauses 2.4.2 to 2.4.5 are complied with.
- 2.4.2 A minimum clear passageway of 550 mm must be provided on deck between the structure of a track-mounted crane and the ship's bulwark or side rails, or between the structure and hatch coamings, except that in the case of a ship built before 17 November 1986, if such passageway is not provided, access by persons to the deck area over which the crane may travel must be prevented.
- 2.4.3 For subclause 2.4.2, the passageway could be a catwalk attached to the structure of the crane and fitted with guard-rails.
- 2.4.4 A bridge or gantry crane must be fitted with:
- (a) unless the crane is mounted on tracks more than 2 m above the deck, an acoustic warning device that emits an audible sound before travelling motion is commenced and continues to sound until travelling motion has ceased; and
 - (b) a horn or similar acoustic warning device capable of being sounded by the crane operator; and
 - (c) an emergency stop switch, clearly labelled and positioned so that it can be readily operated by persons at deck level.
- 2.4.5 An access ladder on a track-mounted crane so located that a person using it could fall into an open cargo space or over the ship's side, must comply with Schedule 2, but in such manner that access to the bottom of the ladder is not impeded.
- 2.4.6 Where the operator's cabin of a track-mounted crane travels with the horizontal movement of a load, arrangements or procedures must be provided enabling the operator to safely leave the cabin in the event of power failure or other emergency. A suitable arrangement would be mobile or portable access or means of returning the cabin to the point of access.
- 2.4.7 A track-mounted crane installed on a ship before 17 November 1986 must comply with subclauses 2.4.1, 2.4.4, 2.4.5 and 2.4.6, so far as is technically practicable.

3 Crane and derrick controls and brakes

3.1 Controls

Crane and winch controls must comply with the following:

- (a) they must be so located that the operator, at the operating position:
 - (i) has sufficient room to operate the controls safely; and
 - (ii) has an unrestricted view of the load and operation area, or of a hatchman; and
 - (iii) remains clear of the load and ropes; and

- (iv) is at no time during the loading or unloading operation sited beneath a load;
- (b) they must be so located that the driver is not placed in the bight of the runner in the vicinity of the heel block of a derrick;
- (c) they must have upon them, or adjacent to them, clear markings to indicate their purpose and mode of operation;
- (d) they must be provided, where necessary, with a suitable locking device to prevent accidental movement or displacement;
- (e) each control must automatically return to the neutral / stop position;
- (f) where possible, control handles must move in the direction of the resultant load movement;
- (g) control wheels must rotate clockwise for winding in a rope and anticlockwise for paying out a rope;
- (h) the distance through which a control is required to move for the full range of operations of that control must not exceed:
 - (i) for hand levers, 600 mm; and
 - (ii) for foot pedals, 250 mm,the distance being measured at the midpoint of the designed handgrip or footrest for the control;
- (i) brake pedals must have a non-slip surface.

3.2 Brakes

3.2.1 A winch must not be used in loading or unloading unless:

- (a) a braking system is fitted for arresting the motion of each drum on which a rope is wound, capable of exerting a restraining torque of not less than 1.5 times the maximum static torque that would be transmitted to the brake by a suspended load equal to the maximum safe working load of the derrick served by the winch; and
- (b) when the winch is under load, all brakes are capable of arresting the motion of the drum that they serve, smoothly and without snatching; and
- (c) if the winch is driven by an internal combustion engine, the winch is so constructed that the load cannot fall by its own weight when the engine is disconnected.

3.2.2 A crane must not be used in loading or unloading, unless:

- (a) it is fitted with a braking or speed-regulating system capable of arresting each type of motion of the crane:
 - (i) smoothly and without snatching; and
 - (ii) in the shortest possible time consistent with safe working; and
- (b) the braking system for arresting the hoisting and luffing motions of the crane is capable of exerting a restraining torque not less than 1.5 times the

maximum static torque transmitted to the braking system by a suspended load equal to the maximum safe working load of the crane and operates automatically when the controls are placed in the stop position; and

- (c) brake systems are activated automatically on the failure of the power drive or the control system and provision has been made for the lowering of a load in the event of such a failure; and
- (d) the braking system is such that the controller does not allow any load to fall at a speed in excess of the design speed.

3.3 Electrically powered equipment

Electrically powered cranes or winches must not be used in loading or unloading unless:

- (a) the operating modes of the controls for the crane or winch are separated by a neutral, stop or off position; and
- (b) the braking system automatically comes into operation when there is a significant drop in the supply of electrical power; and
- (c) there is provided conveniently close to the operator an emergency or isolating switch by means of which the power supply to the winch, or to hoisting, luffing, slewing, travelling or traversing motors may be shut down without affecting lighting, indicators, electromagnetic lifting devices, cargo hook or twist lock controls, and without affecting other circuits not controlling the motion of the load or the crane.

3.4 Gear transmission

A winch fitted with more than 1 transmission ratio must be provided with a positive means of locking the gear shifting device or devices.

3.5 Information on defined limits

A crane must not be used in loading or unloading unless there is provided in a position conveniently visible to the driver:

- (a) where the crane is a jib crane:
 - (i) operating instructions in English, for the range of outreach over which the luffing motion may be used and the safe working load for outreach distance within that range; and
 - (ii) except where the safe working load does not vary within the range of the crane, a device or instrument that continuously indicates the outreach; and
- (b) where the crane is designed to operate within defined limits of list or trim:
 - (i) instructions in English for the operation of the crane within those limits; and
 - (ii) a device or instrument that indicates whether or not the crane is within those limits; and

- (c) where the crane is provided with gearing or other devices for changing the speed range in the hoisting motion, instructions in the English language stating the safe working load for each operating speed range.

3.6 Remote controls

A crane, or winches associated with a derrick crane controlled externally by remote controls, must not be used in loading or unloading a ship unless the operation of the controls provides compliance with subclause 3.1. Remote controls using radio or acoustic transmission of control orders and equipment state must not be used if the system can be affected by extraneous transmissions.

Schedule 8 Requirements for specialised handling systems

(subsection 29.1)

- 1 In this Schedule, *specialised handling system* means a method of loading or unloading cargo that employs specialised material handling equipment designed to dispense with manual handling of cargo by sling, tray, tub, pallet or similar cargo gear, including reclaiming devices, conveyor belts and the handling of multiple units connected together by twistlocks, banding or strapping, or similar appliances, that have not been individually tested and marked in accordance with this Order.
- 2 A specialised handling system must not be used in loading or unloading a ship, unless the person in charge has ensured that appropriate safety precautions are given effect in and near the area of operation of the system to protect all persons against accidental injury arising from its use.
- 3 For clause 2, appropriate safety precautions include:
 - (a) fencing, approximately 1 m high, of wooden hurdles or rope stretched taut to be placed on shore at least 3 m from, and on each side of, the path of the load, such that the fenced area extends far enough from the ship's side to ensure that persons do not inadvertently pass under suspended or swinging loads; and
 - (b) where ropes are used for fencing, strips of coloured material to be placed at 2 m intervals; and
 - (c) a warning notice approximately 1 m by 500 mm clearly marked 'BEWARE—CARGO PASSING OVERHEAD—NO ENTRY' in prominent lettering to be placed both on the ship and on the shore in conspicuous and adequately illuminated positions; and
 - (d) the working area in the ship's cargo space or spaces and on shore to be sufficient to permit persons to move to a place of safety while a load is being hoisted or landed; and
 - (e) access to the ship to be provided clear of the fenced area.
- 4 A specialised handling system must not be used in loading or unloading a ship, unless there is made available to the person in charge, the manufacturer's specification and operating instructions in English, including:
 - (a) details of the manner by which the safe working load has been established and the safety factor used; and
 - (b) a description of the method by which cargo should be handled and the mode of operation of any control mechanisms, including the means for cutting off power in an emergency; and
 - (c) any limitations on the use of the equipment or any of its component parts, and, unless the system is operated in the manner prescribed by, and within the limitations of, the manufacturer's specification and instructions; and

- (d) for limited use wire lifting strappings, a test certificate must be available, in English, describing the manner of the strapping construction and the minimum tensile breaking load obtained for the batch test carried out.
- 5 A specialised handling system controlled remotely by light, sound or radio signals, without direct mechanical connection, must not be used in loading or unloading without the approval of the Manager, Ship Inspection and Registration.
- 6 A documented record of the lifts and movements conducted by a system designed for limited lifts of cargo must be maintained by the ship's master and made available to the person in charge.
- 7 If, in relation to the record required in clause 6:
- (a) the record is not available; or
 - (b) doubts about the accuracy or authenticity of the record exist; or
 - (c) the record indicates that the maximum number of lifts or movements has been reached or exceeded; or
 - (d) the record is in anyway incomplete or does not satisfy the person in charge that the system can safely be used;

the cargo must not be loaded, moved or discharged using that system and the person in charge must ensure that another appropriate means of loading, moving or discharging the cargo is used.

Schedule 9 Marking of cargo mass

(subsection 24.1)

1 Gross mass of cargo

- 1.1 An individual article of cargo, or unitised articles of cargo, the gross mass of which is 1 tonne or more, must not be loaded or unloaded unless:
- (a) there is marked on it, or on a securely attached label, the gross mass of the package, article or unit, in legible characters not less than 25 mm in height; or
 - (b) where it is to be unloaded, the person in charge has been advised by the ship's master of the gross mass of the package, article or unit.

Examples of articles of cargo

a container; a portable tank, an intermediate bulk container, a returnable cargo unit, logs, timber, steel products, break bulk, pre slung cargo.

- 1.2 If the actual gross mass is not marked on an article of transport equipment, the shipper is taken to have declared that the actual gross mass is equal to the maximum gross mass or, in the case of a flexible intermediate bulk container, the SWL marked on the item.

2 Mass of unitised and pre-slung cargo

For clause 1, where packages or articles of cargo are grouped or preslung so as to be handled as a single unit and the aggregate gross mass of the unit does not exceed the designated maximum gross mass of the unit marked on the unit or a label, the gross mass of the unit is taken to be the designated maximum gross mass.

3 Mass of transport equipment

- 3.1 Subject to subclause 3.2, where an article of transport equipment is to be loaded or unloaded, the gross mass of that article is taken to be the maximum operating gross mass or rating of the article, or SWL in the case of a flexible intermediate bulk container, unless the actual gross mass has been marked upon it or the person in charge has been advised of the actual gross mass.
- 3.2 The gross mass of an article of transport equipment referred to in subclause 3.1 that does not contain cargo and is declared to be empty:
- (a) where the article is to be loaded — by the shipper; or
 - (b) where the article is to be unloaded — by the master or agent;
- is taken to be the tare mass of the article.

4 Gross mass of mechanical stowing appliance

- 4.1 A mechanical stowing appliance, or part of such an appliance, must not be hoisted or lowered where the gross mass of the appliance or the part is 1 tonne or more, unless there is prominently marked on the appliance or part, or on a

securely attached label, the gross mass in legible characters not less than 25 mm in height.

- 4.2 For subclause 4.1, the gross mass of a mechanical stowing appliance or part of such an appliance, includes the mass of the appliance or part, fully equipped and, where appropriate, fuelled.

Schedule 10 Approved splices in wire rope

(subsection 29.1)

1 General

- 1.1 For paragraph 2.1(c) of Schedule 5, a splice is required to be well made and tightly drawn, and must comply with subclause 2.1 or 2.2 or clause 3 of this Schedule, as appropriate.
- 1.2 The first set of tucks mentioned in clause 2 may be made in any sequence that will enable the splice to be properly made and tightly drawn.
- 1.3 The number of tucks specified in clause 2 is the minimum to be used, more tucks being permissible if desired.

2 Types of splice

- 2.1 Hand spliced eyes should comply with the relevant requirements of Australian Standard AS 2759. Care should be taken to ensure that all splices are well made and tightly drawn.
- 2.2 Splices must be commenced with a first tuck of each strand end, so that the strand ends leave the rope at the same position along the rope and equally distributed around the rope. Each whole strand end must then include, at least, a second, a third and a fourth tuck (the 3 being the same type). The splice must then include a fifth set of tucks for tapering the splice in accordance with paragraphs (a) to (e) or for turning in the ends in accordance with (f). The tucks after the first are to be:
 - (a) 3 sets of tucks, with each tuck using a whole strand end of the rope and made over one and under one against the lay. After the fourth tuck, alternate strand ends are cut out and the remaining strand ends tucked similarly to the previous three tucks;
 - (b) 3 sets of tucks, with each tuck using a whole strand end of the rope and made over 1 and under 2 against the lay. After the fourth tuck, either alternate strand ends are cut out or half the wires are cut out of each strand ends and the remaining strand ends or remaining wires tucked similarly to the previous 3 tucks;
 - (c) 3 sets of tucks, with each tuck using a whole strand end of the rope and made over 1 against the lay and under 2 with the lay. After the fourth tuck, half of the wires are cut out of each of the strand ends and the remaining wires in each strand end tucked similarly to the previous 3 tucks;
 - (d) 3 sets of tucks, with each tuck using a whole strand end of the rope and made over 1 against the lay and under 2 with the lay. After the fourth tuck, half of the wires are cut out of each of the strand ends and the remaining wires in each strand end tucked over 1 and under 2 against the lay;
 - (e) 3 sets of tucks, with each tuck using a whole strand end of the rope and made over 2 against the lay and under 2 with the lay. After the fourth tuck,

half of the wires are cut out of each of the strand ends and the remaining wires in each strand end tucked similarly to the previous 3 tucks;

- (f) second, third and fourth tucks must be made as detailed in paragraphs (a) to (e). After the fourth tuck, alternative ends are tucked backwards into the rope so as to conceal the ends and the remaining alternative ends are tucked in the same direction and then tucked backwards into the rope to conceal the ends.

3 Swaged splices

- 3.1 A looped eye or thimble secured by means of a compressed metal ferrule is acceptable as a splice, provided that:
 - (a) the material used for the manufacture of the ferrule withstands plastic deformation without cracking; and
 - (b) the size of the ferrule is suitable for the diameter of the rope forming the splice and of adequate length in relation to the intended load; and
 - (c) the end of the rope forming the loop passes completely through the ferrule; and
 - (d) the die used to compress the ferrule is of appropriate size; and
 - (e) the compression pressure to clamp the ferrule is suitable for the die used and adequate to ensure the necessary clamping.
- 3.2 An alternative method for securing the end of the rope forming the loop may be accepted by the Manager, Ship Inspection and Registration on the report of a surveyor, if a test in accordance with subclause 8.3.1 of Schedule 4 demonstrates the adequacy of the arrangement.
- 3.3 For subclause 3.1, the following patented methods of swaged splices are acceptable:
 - (a) Australoc;
 - (b) Marsplice;
 - (c) Superloop;
 - (d) Talurit;
 - (e) U.S. Wire Rope.

Schedule 11 Forms

(subsections 29.3, 31.1 and 31.2)

Form MO 32/1

**CERTIFICATE OF TEST AND EXAMINATION OF DERRICKS,
CRANES AND CARGO LIFTS**

Ship

Certificate No

<i>Articles</i>			<i>Angle to the horizontal of derrick or crane for purpose of test*</i>	<i>Proof load applied</i>	<i>Date of test</i>	<i>Safe working load</i>	<i>Method used in applying the proof load</i>
<i>Situation</i>	<i>Distinguishing numbers or marks</i>	<i>Description</i>					

Name and address of testing establishment

.....

.....

CERTIFICATION

I,, a competent person for Marine Order 32 (Cargo Handling Equipment), certify that on the date shown in the column headed 'Date of test' in the table above:

- I tested the articles of material handling equipment identified in that table, in the manner specified in Schedule 4 to Marine Order 32 for the testing establishment mentioned above and am in all respects satisfied that each article identified is of sufficient strength to carry the safe working load specified in the column headed 'Safe working load' in the table, relating to that article; and
- I made a thorough examination of each article identified and am in all respects satisfied from the examination that each such article withstood the proof test without injury or deformation.

Position	Technical qualifications
Address	Signature
...../...../..... Date

* In the case of a crane or derrick crane, the load radius at which the crane or derrick crane was tested may be inserted in this column.

Form MO 32/2

**CERTIFICATE OF TEST AND EXAMINATION OF CARGO
GEAR, BEING
BLOCKS, CHAINS, RINGS, HOOKS, SHACKLES, SWIVELS, ETC**

Ship or store

Certificate No

<i>Distinguishing numbers or marks of articles</i>	<i>Description of articles</i>	<i>Material of articles</i>	<i>Number of articles tested</i>	<i>Proof load applied</i>	<i>Date of test</i>	<i>Safe working load</i>	<i>Name and address of makers or suppliers of articles</i>

Name and address of testing establishment

.....

.....

CERTIFICATION

I,, a competent person for Marine Order 32 (Cargo Handling Equipment), certify that on the date shown in the column headed 'Date of test' in the table above:

- I tested the articles identified in the table, in the manner specified in Schedule 4 to Marine Order 32, for the testing establishment mentioned above; and
- I am in all respects satisfied that each article identified is of sufficient strength to carry the safe working load specified in the column headed 'Safe working load' in the table, relating to that article; and
- I made a thorough examination of each article identified; following application of the proof load, each such article was found to have withstood the load without injury or deformation and to be free from cracks, flaws and other defects.

Position	Technical qualifications
Address	Signature
...../...../..... Date

Form MO 32/3

**CERTIFICATE OF TEST AND EXAMINATION OF PERSONNEL
CRADLES, CARGO TRAYS, CRATES, TUBS AND OTHER
LOADING AND UNLOADING RECEPTACLES**

Certificate No

<i>Distinguishing numbers or marks of articles</i>	<i>Description of articles</i>	<i>Material of articles</i>	<i>Number of articles tested</i>	<i>Proof load applied</i>	<i>Date of test</i>	<i>Safe working load</i>	<i>Name and address of makers or suppliers of articles</i>

Name and address of testing establishment
.....
.....

CERTIFICATION

I,, a competent person for the purposes of Marine Order 32 (Cargo Handling Equipment), certify that on the date shown in the column headed 'Date of test' in the table above:

- I tested the articles identified in the table, in the manner specified in Schedule 4 to Marine Order 32, for the testing establishment mentioned above; and
- I made a thorough examination of each article identified; following application of the proof load, each such article was found to have withstood the load without injury or deformation and to be free from cracks, flaws and other defects.

Position	Technical qualifications
Address	Signature
...../...../..... Date

Form MO-32/4**CERTIFICATE OF TEST AND EXAMINATION OF WIRE ROPE**

Certificate No

Name and address of manufacturer

Name
Address

Details of rope

Diameter of rope (mm)	Number of strands	Number of wires per strand
Lay	Core	
Specification to which wires conform		
Breaking tensile load of sample of the rope		Date of tensile test
Safe working load — subject to any stated qualifying conditions (such as minimum pulley diameter and direct tensile load)		

Name and address of person, firm or company making test and examination

Name
Address

I,, a competent person for the purposes of Marine Order 32 (Cargo Handling Equipment), certify that the above particulars are correct.

Signature

Date //

Wire rope supplied to
To be used for

Note

1. All legislative instruments and compilations are registered on the Federal Register of Legislative Instruments kept under the *Legislative Instruments Act 2003*. See <http://www.frli.gov.au>.