



**Australian Government**  
**Australian Maritime Safety Authority**

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**Marine Order 32 (Cargo handling equipment) 2016**

**made under the *Navigation Act 2012***

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Prepared by the Australian Maritime Safety Authority

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## Division 1 Preliminary

### 1 Name of Order

This Order is *Marine Order 32 (Cargo handling equipment) 2016*.

### 2 Purpose

This Order:

- (a) prescribes matters for machinery and equipment that belong to a vessel and are used for loading or unloading the vessel, including inspection, testing, maintenance and operation; and
- (b) gives effect to those parts of the following instruments of the International Labour Organization that apply to machinery, appliances and equipment that belong to a vessel and are used for loading or unloading the vessel:
  - (i) *Convention No. 27, Marking of Weight (Packages Transported by Vessels), 1929*, as in force from time to time;
  - (ii) *Convention No. 152, Occupational Safety and Health (Dock Work), 1979*, as in force from time to time;
  - (iii) *Recommendation No.160, Occupational Safety and Health (Dock Work), 1979*, as in force from time to time;
  - (iv) the ILO Code.

### 3 Power

- (1) The following provisions of the Navigation Act provide for this Order to be made:
  - (a) subsection 112(5) which provides that the regulations may provide for the loading, stowing or carriage of cargo in vessels, the unloading of cargo from vessels, and the giving of notices about those matters;
  - (b) paragraph 125(2)(c) which provides that the regulations may provide for checks and tests of machinery and equipment;
  - (c) paragraph 339(2)(b) which provides that the regulations may provide for machinery and equipment to be carried on board vessels;
  - (d) paragraph 339(2)(c) which provides that the regulations may provide for the operating, maintaining, checking and testing of the machinery and equipment;
  - (e) subsection 341(1) which provides that the regulations may provide for the imposition of penalties for the contravention of provisions of the regulations including the imposition of civil penalties.
- (2) Subsection 339(1) of the Navigation Act provides that the regulations may prescribe 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.
- (3) Subsection 342(1) of the Navigation Act provides that AMSA may make a Marine Order about anything that must or may be made by the regulations.

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**4 Definitions**

In this Order:

**bulk carrier** has the same meaning as in Regulation 1 of Chapter IX of SOLAS as clarified by IMO Resolution MSC.277(85), as in force from time to time.

**cargo space** means a space that is:

- (a) intended for the carriage of cargo, including a trunkway or hatchway to the space; and
- (b) above or below deck; and
- (c) enclosed or open.

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

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

- (a) for carrying out testing, examination in accordance with sections 4.2.2 to 4.2.5 of the ILO Code (known as thorough examination) and issuing certificates of test for equipment under this Order — is appointed by:
  - (i) the manufacturer of the equipment; or
  - (ii) a recognised organisation, or a classification society recognised by the country in which the vessel is registered, under a scheme of classification or certification of the equipment; or
  - (iii) a testing establishment that AMSA is satisfied:
    - (A) is competent to test and examine material handling equipment; and
    - (B) has the necessary equipment for testing and examination; or
- (b) for carrying out examinations in accordance with section 4.2.4 of the ILO Code, other than those associated with testing of equipment under this Order or for determining the safe working load of loose gear that is not required to be permanently marked with a SWL:
  - (i) is appointed by the owner or master of the vessel; and
  - (ii) if the person is a seafarer who holds any of the following positions on board the vessel:
    - (A) master; or
    - (B) chief mate; or
    - (C) chief engineer; or
    - (D) second engineer.

*Note* In the Australian maritime industry, the engineer officer who performs the functions of a Second engineer specified by STCW Code Table A-III/2 column 1, is generally referred to as the First engineer.

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

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

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

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

**IMDG Code** means the International Maritime Dangerous Goods Code published by the International Maritime Organization, as in force from time to time.

**inspection**, for material handling equipment, means a 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, as defined in the IMDG Code, that is resistant to stresses produced in handling and transport, as determined by tests that are consistent with:

- (a) Chapter 6.5 of the IMDG Code; or
- (b) Chapter 6.5 of the latest edition of *Recommendations on the Transport of Dangerous Goods — Model Regulations, published by the United Nations*; or
- (c) AS 3668-1989 *Flexible intermediate bulk containers — Non-dangerous goods* as in force on 1 January 2017.

**lifting appliance** means a stationary or mobile cargo-handling appliance belonging to a vessel that is used on board the vessel for suspending, raising, lowering or moving loads from one position to another while suspended or supported, including a crane, derrick crane, derrick, stores crane, cargo lift or mechanical ramp.

**loading** means:

- (a) either:
  - (i) conveying a load from a place, including another vessel, next to a vessel:
    - (A) to a location on board the vessel; or
    - (B) to a second vessel for transfer onto the vessel; or
  - (ii) transferring a load between locations on board a vessel; and
- (b) including associated operations such as lashing and securing cargo and inserting clamps and pins in securing devices; and
- (c) not including transferring between locations on board the vessel:
  - (i) stores, equipment or fuel belonging to the vessel; or
  - (ii) mails; or
  - (iii) passengers' luggage.

**loose gear** means an item of equipment on board a vessel and belonging to the vessel 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.

**material handling equipment** means an article or an integrated assembly of articles, on board a vessel and belonging to the vessel, that is designed to convey or for use in conveying cargo, including a lifting appliance, loose gear or mechanical stowing appliance.

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**mechanical stowing appliance** means a wheeled or tracked machine or vehicle, including a lift truck, straddle truck, side-loader, tractor, bulldozer, front-end loader, trailer or truck, that:

- (a) belongs to a vessel; and
- (b) is on board the vessel; and
- (c) is designed to convey or move cargo.

**pallet** means a load-carrying platform with 1 deck, or 2 interconnected decks, that permit the entry of lifting equipment, such as fork arms, tines, bars or slings.

**passageway** includes an area providing a means of access through and around structures where cargo is not stowed and does not include working areas or crane pedestals.

**register of material handling equipment** means the register mentioned in section 25.

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

*Examples*

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

**returnable cargo unit** means a packaging, into which cargo is packed, that:

- (a) is intended to convey cargo from consignor to consignee; and
- (b) is designed to be handled as a single unit; and
- (c) is not a container or intermediate bulk container; and
- (d) is fitted with integral lifting attachments; and
- (e) is intended for return and subsequent re-use; and
- (f) is or is not 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 lifted safely by a lifting appliance or item of loose gear in a given condition.

*Note* SWL is also known as ‘rated load’ or ‘working load limit’.

**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 vessel.

**transport equipment** means non-disposable equipment that is used in the transport of a combination or aggregation of cargo as a single unit, including a container, intermediate bulk container, returnable cargo unit or shipborne barge, but not including loose 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 cargo transport unit or pallet.

**upper deck**, for a vessel, means, the following decks if the vessel is carrying cargo on or above those decks:

- (a) the freeboard deck;

(b) the raised forecastle and poop deck.

**unloading** means conveying a load from a location on board a vessel:

- (a) to:
- (i) a place, including another vessel, next to the vessel; or
  - (ii) a second vessel for transfer to a place, including another vessel, next to the vessel; and
- (b) including associated operations such as unlashings cargo and removing clamps and pins from securing devices.

**working area** means an area, in a cargo hold or on or above the upper deck, that is designed for stowing and securing cargo.

*Note 1* Information on obtaining copies of any IMO Resolution, IMO document or other document that is mentioned in this Order is available from the AMSA website Marine Orders link at <http://www.amsa.gov.au>. Copies of incorporated documents will be made available for viewing free of charge at the nearest AMSA office, on request.

*Note 2* Some terms used in this Order are defined in *Marine Order 1 (Administration) 2013*, including:

- IMO
- offshore industry mobile unit
- SOLAS.

*Note 3* Other terms used in this Order are defined in the *Navigation Act*, including:

- AMSA
- cargo
- container
- dangerous goods
- inspector
- master
- owner
- port
- recognised organisation
- seafarer.

*Note 4* Recognised organisations are listed in *Marine Order 1 (Administration) 2013*.

*Note 5* For delegation of AMSA's powers under this Order — see the AMSA website Marine Orders link at <http://www.amsa.gov.au>.

## 5 Interpretation

For this Order, a vessel is taken to have been constructed when:

- (a) the keel is laid; or
- (b) construction identifiable with the vessel starts and the lesser of at least 50 tonnes, or 1% of the estimated mass of all structural material, of the vessel is assembled.

## 6 Application

- (1) This Order applies to:
- (a) loading or unloading a regulated Australian vessel anywhere; and
  - (b) loading or unloading a foreign vessel at an Australian port; and

- (c) loading or unloading of a foreign vessel that is an offshore industry mobile unit:
  - (i) at an Australian port; or
  - (ii) in the territorial sea of Australia.
- (2) 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.

## **7 Exemptions**

- (1) A person may apply to AMSA, in accordance with the application process set out in *Marine Order 1 (Administration) 2013*, for an exemption of a vessel from a requirement of this Order.
- (2) AMSA may give an exemption only if satisfied that:
  - (a) compliance with the requirement would be unnecessary or unreasonable having regard to the vessel, its equipment and its intended voyage; and
  - (b) giving the exemption would not risk the safety of a person or damage the vessel or the environment.

*Note* *Marine Order 1 (Administration) 2013* deals with the following matters about exemptions and equivalents:

- making an application
  - seeking further information about an application
  - the time allowed for consideration of an application
  - imposing conditions on approval of an application
  - notification of a decision on an application
  - review of decisions.
- (3) AMSA may allow a provision of this Order to be dispensed with for a loading or unloading operation, subject to any conditions, if:
    - (a) an event or incident has damaged or affected material handling equipment or arrangements; and
    - (b) a written request is received; and
    - (c) AMSA is satisfied that dispensing with the provision would not risk the safety of a person or damage the vessel or the environment.

## **8 Equivalents**

- (1) A person may apply to AMSA, in accordance with the application process set out in *Marine Order 1 (Administration) 2013*, for approval to use an equivalent.
- (2) AMSA may approve use of an equivalent only if satisfied that use of the equivalent would be at least as effective as compliance with the requirement to which the equivalent is an alternative.

## **Division 2 Requirements for loading or unloading a vessel**

### **9 Functions and duties of master**

- (1) The master of a vessel must ensure that operations are carried out in accordance with this Order, including loading and unloading, and testing, examination and inspection of material handling equipment.

*Note* Division 4 of Part 4 of Chapter 3 of the Navigation Act deals with offences and civil penalties for passenger and cargo operations.

- (2) For paragraph (l) of the definition of *marine incident* in subsection 14(1) of the Navigation Act, the failure in operation of a component of material handling equipment, whether or not a person is injured because of the failure, is prescribed.

*Note 1* The owner and master of a vessel must report marine incidents to AMSA — see sections 185 and 186 of the Navigation Act.

*Note 2* For the prescribed periods for reporting marine incidents — see *Marine Order 1 (Administration) 2013*. Approved forms for the reporting of marine incidents are available on AMSA's website at <http://www.amsa.gov.au>.

## 10 Loading and unloading — employment of seafarers

For paragraph 94(1)(b) of the Navigation Act, the requirements are that:

- (a) the master agrees to the seafarer loading or unloading the vessel; and
- (b) the master must notify AMSA in writing of the agreement as soon as practicable; and
- (c) the notification must occur before the operation starts.

*Note* Section 94 of the Navigation Act provides that seafarers may be employed in handling cargo in connection with loading or unloading a vessel only if sufficient shore labour is not available.

## 11 Use of equipment

- (1) A person may operate a power operated hatch cover on a vessel only if the person:
- (a) is a seafarer of the vessel; or
  - (b) has been authorised to do so by:
    - (i) the officer in charge of the deck watch; or
    - (ii) the chief mate; or
    - (iii) the master of the vessel.
 Penalty: 50 penalty units.
- (2) A person may operate vessel's side, bow or stern doors, 'tween deck bulkhead doors, ramps, retractable car decks or other vessel equipment related to cargo space access only if the person:
- (a) is a seafarer of the vessel; and
  - (b) is authorised to do so by the master of the vessel.
- Penalty: 50 penalty units.
- (3) A person must not 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.
- Penalty: 50 penalty units.
- (4) An offence against subsection (1), (2), or, (3) is a strict liability offence.
- (5) A person is liable to a civil penalty if the person contravenes subsection (1), (2) or (3).
- Civil penalty: 50 penalty units.

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- (6) Material handling equipment that is used for loading or unloading a vessel and that is not mentioned in this Order must comply with the ILO Code.

**12 Removal of equipment**

- (1) While a vessel is being loaded or unloaded, a person may only remove or interfere with material handling equipment required by this Order:
- (a) if there is an emergency; or
  - (b) as directed by:
    - (i) the duty officer on the vessel watch; or
    - (ii) the chief mate; or
    - (iii) the master of the vessel.
- Penalty: 50 penalty units.
- (2) An offence against subsection (1) is a strict liability offence.
- (3) A person is liable to a civil penalty if the person contravenes subsection (1).  
Penalty: 50 penalty units.
- (4) A person to whom subsection (1) applies must replace or restore the material handling equipment as soon as there is no longer any reason for its removal or interference.

**13 Loading and unloading — general requirements**

The master of a vessel must ensure that any loading or unloading of cargo using material handling equipment complies with Schedule 1.

*Note* Schedule 1 sets out the master's obligations for safety during cargo operations.

**14 Unsafe or inadequate loading or unloading arrangements**

- (1) For paragraph 112(5)(c) of the Act, AMSA may give written notice to a person if AMSA considers that:
- (a) the person is responsible for the loading, unloading, stowage or carriage of cargo on the vessel; and
  - (b) the loading, unloading, stowage or carriage of cargo on the vessel is or is likely to be unsafe.
- (2) The notice may:
- (a) prohibit loading, unloading, stowage or carriage of the cargo on the vessel; or
  - (b) require additional conditions to be met, either generally or for a particular vessel or a particular cargo; or
  - (c) require verification of the mass of a cargo unit.
- (3) A person must comply with a notice given to the person under subsection (1).  
Penalty: 50 penalty units.
- (4) An offence against subsection (3) is a strict liability offence.
- (5) A person is liable to a civil penalty if the person contravenes subsection (3).  
Civil penalty: 50 penalty units.

*Note* It is an offence not to take proper precautions in loading or unloading a vessel — see section 114 of the Navigation Act.

## 15 Access on board vessels and safety of cargo spaces

- (1) The master of a vessel must ensure that access to cargo spaces and lifting appliances on board the vessel complies with Schedule 2.
- (2) The master of a vessel must ensure that cargo spaces on board the vessel have a safe atmosphere in accordance with Schedule 1.

*Note 1* There are recommendations on appropriate safety measures to be taken when using pesticides on vessels in the Supplement to the IMDG Code. Other authorities, such as port authorities, may impose additional requirements.

*Note 2* For requirements relating to the following matters about means of access to vessels in port see sections 22 to 24 of *Marine Order 12 (Construction — subdivision and stability, machinery and electrical installations) 2016*:

- Construction and other requirements
- Responsibilities of persons boarding or disembarking
- Responsibilities of the master.

*Note 3* The means of access may be provided by the vessel or the shore terminal.

## 16 Marking of cargo mass

- (1) The shipper of an individual article of cargo, or unitised articles of cargo of at least 1 tonne gross mass, to be loaded on or unloaded from a vessel at an Australian port must mark the cargo with its gross mass in accordance with Schedule 7.

Penalty: 50 penalty units.

*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 or pre slung cargo.

- (2) An offence against subsection (1) is a strict liability offence.
- (3) A person is liable to a civil penalty if the person contravenes subsection (1).  
Civil penalty: 50 penalty units.
- (4) A shipper must not provide information, or place a marking on, a unitised article of cargo mentioned in subsection (1), that indicates a false gross mass or a false maximum gross mass.  
Penalty: 50 penalty units.
- (5) An offence against subsection (4) is a strict liability offence.
- (6) A person is liable to a civil penalty if the person contravenes subsection (4).  
Civil penalty: 50 penalty units.
- (7) 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 safe working load SWL or maximum gross mass marked on the unitised article of cargo.

## 17 Weighing of cargo

An inspector may require a person to weigh an article of cargo or goods that are not cargo and may nominate the weighing instrument to be used.

## **Division 3 Safe working load and certificates**

### **18 Drawings and operational instructions**

- (1) The owner of a vessel on which lifting appliances are installed for use in loading or unloading the vessel must keep on board the vessel:
  - (a) a rigging plan; and
  - (b) drawings of the lifting appliances; and
  - (c) instructions for using the lifting appliances.  
Penalty: 50 penalty units.
- (2) An offence against subsection (1) is a strict liability offence.
- (3) A person is liable to a civil penalty if the person contravenes subsection (1).  
Civil penalty: 50 penalty units.
- (4) The master of the vessel must give, on request, the documents mentioned in subsection (1) to:
  - (a) the terminal operator; and
  - (b) the person responsible for loading or unloading the vessel.

### **19 Determination and marking**

- (1) The master may permit the use of an article of material handling equipment for loading or unloading a vessel only if:
  - (a) a competent person, having regard to the design, strength, material of construction and proposed use of the article has determined the safe working load of the article; and
  - (b) the safe working load is marked on the article in a way that is durable and readily visible.
- (2) Subsection (1) does not apply to fibre rope, nets or slings.

### **20 SWL standards**

In determining the safe working load of an article of material handling equipment, a competent person must apply an Australian standard, or an equivalent international standard, that applies to the article.

### **21 Material handling equipment loads**

- (1) A person who uses material handling equipment must ensure that it is used in accordance with Schedule 5.
- (2) For loading or unloading a vessel, an article of material handling equipment may be used to handle a load exceeding the safe working load of the equipment only in accordance with clauses 1 and 2 of Schedule 5.
- (3) The mass of any loose gear, spreader or equalising beam attached to the lifting appliance must be taken into account in calculating the load on a lifting appliance.

### **22 Testing, examination, inspection and certification**

- (1) Each item of material handling equipment and each sling or lifting device forming an integral part of a load must comply with the provisions of Schedules 4, 6 and 8 that apply to the type of equipment.

- (2) Material handling equipment may be used for loading or unloading only if:
  - (a) it has been tested, examined and certified and inspected in accordance with Schedule 3; 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.

*Note* Section 127 of the Navigation Act provides an offence for failure to comply with machinery and equipment checks required by the regulations.

## **23 Certificate of test**

- (1) If material handling equipment has been tested and examined in accordance with Schedule 3 and the competent person considers that it is satisfactory, he or she must issue a certificate of test.
- (2) A certificate of test for material handling equipment manufactured or tested in Australia must be in the approved form.

*Note* The approved forms for a certificate of test are available on AMSA's website at <http://www.amsa.gov.au>.

- (3) A certificate of test for material handling equipment manufactured in a country other than Australia and tested or examined in a country other than Australia by a competent person is taken to be in the approved form if it contains information that AMSA considers is equivalent to that required by the approved form.
- (4) A certificate of test issued by or for the manufacturer of wire, rope or chain is taken to be a certificate of test for any portion of the wire, rope or chain.

## **24 Record of inspection**

- (1) For loose gear not mentioned in Schedule 3, a competent person or a responsible person must conduct an inspection each time before the equipment is used in a cargo operation.
- (2) The person who conducts the inspection must prepare a record of inspection.
- (3) The record of inspection may be in any form but must include:
  - (a) details of the equipment's safe working load and identity as marked on it by the manufacturer; and
  - (b) the signature of the person who conducted the inspection.

## **25 Register of material handling equipment**

- (1) The master of a vessel must keep on the vessel an up-to-date register of material handling equipment belonging to the vessel.

Penalty: 50 penalty units.
- (2) A competent person or responsible person who supervises or carries out tests, examinations, inspections, heat treatment or any maintenance, repair or replacement of components of material handling equipment must record particulars of the work in the register of material handling equipment.

Penalty: 50 penalty units.
- (3) An offence against subsection (1) or (2) is a strict liability offence.

- (4) A person is liable to a civil penalty if the person contravenes subsection (1) or (2).
- Civil penalty: 50 penalty units.
- (5) A register of material handling equipment may be kept in any convenient form subject to the following conditions:
- the register must contain the information required by this Order;
  - each entry must be clearly legible;
  - each entry must be authenticated by the competent or responsible person supervising or carrying out the work mentioned in subsection (2).

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

## **26 Certificate of test or record of inspection to be kept on vessel**

A certificate of test or record of inspection of material handling equipment on a vessel, or a copy of the certificate or record, must be kept on board the vessel with the register of material handling equipment if it:

- is current for equipment to which this Order applies; and
- applies to equipment that is intended for use in a current loading or unloading operation.

## **Division 4 Maintenance and repair of equipment used in loading and unloading**

### **27 General**

The owner of the vessel must maintain material handling equipment, mechanical ventilation equipment, lighting and other equipment used in loading or unloading the vessel.

### **28 Ship machinery**

The master of a vessel may allow vessel machinery to supply power to material handling equipment or other equipment being used for loading or unloading only if there are sufficient qualified seafarers to maintain the engineering watch to comply with the vessel's minimum safe manning certificate issued under Regulation 14 of Chapter V of SOLAS.

### **29 Repairs to material handling equipment**

- (1) A person may carry out repair work on material handling equipment only if the person is:
- competent in the repair of that kind of equipment; and
  - equipped to perform the repair.
- Penalty: 50 penalty units.
- (2) An offence against subsection (1) is a strict liability offence.
- (3) A person is liable to a civil penalty if the person contravenes subsection (1).
- Civil penalty: 50 penalty units.

**30 Repaired equipment**

- (1) The master of a vessel may permit the use of repaired material handling equipment before it has been tested and examined in accordance with Schedule 3 only if:
  - (a) it has been inspected by a competent person and the details of the inspection and repair entered in the register of material handling equipment; and
  - (b) the repair is:
    - (i) the normal periodic replacement of an individual component by a component with the same technical specification; or
    - (ii) a repair to a non stress bearing component.
- (2) The master of a vessel may permit the use of repaired material handling equipment the repair of which is not mentioned in paragraph (1)(b) only if:
  - (a) it has been examined by a competent person or a responsible person in accordance with section 4.2.4 of the ILO Code; and
  - (b) details of the examination and repair have been recorded in the register of material handling equipment.

**31 Heat treatment**

- (1) The master of a vessel may permit the use on the vessel in loading or unloading of a chain, ring, hook, shackle, swivel, connecting plate or overhauling weight that is subject to stress only if it has been examined by a competent person to determine if heat treatment is necessary.
- (2) The examination mentioned in subsection (1) must occur before the equipment is used:
  - (a) for the first time; and
  - (b) following a repair.
- (3) If heat treatment is necessary, it must be applied under the supervision of a competent person using a process appropriate to the material and designed to restore its mechanical properties or to relieve stress.

**32 Transitional**

- (1) A test or examination conducted under Issue 1 or 2 of *Marine Orders Part 32*, *Marine Order 32, issue 3* or *Marine Order 32 (Cargo handling equipment) 2011* is taken to be a test, examination or inspection conducted in accordance with this Order.

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- (2) A certificate of test under or recognised for Issue 1 or 2 of *Marine Orders Part 32*, *Marine Order 32, issue 3* or *Marine Order 32 (Cargo handling equipment) 2011* is taken to be a certificate issued under this Order.
- (3) A vessel built before 1 January 2015 that cannot comply with any of the following provisions because of the design and construction of the vessel is taken to comply with the provision if it complies with the corresponding provision of Issue 2 of *Marine Orders Part 32* as in force on 5 December 2011:
- (a) Schedule 2, subclause 6(3);
  - (b) Schedule 2, subclause 9(1);
  - (c) Schedule 2, subclause 12(2);
  - (d) Schedule 2, paragraph 13(1)(a);
  - (e) Schedule 2, clause 15;
  - (f) Schedule 2, subclauses 16(1) and (2);
  - (f) Schedule 2, paragraph 16(4)(d);
  - (g) Schedule 2, subclause 18(3).

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## Schedule 1 Safety during cargo operations

(section 13 and subsection 15(3))

### 1 Safe atmosphere

- (1) The master of the vessel must take precautions to prevent access by persons to a cargo space that may have an unsafe atmosphere.
- (2) The master of the vessel must take precautions to prevent access by persons to a cargo space that has been fumigated until the atmosphere in the space is safe.

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

- (3) If cargo operations might reduce the safety of the atmosphere, such as in a ro-ro vehicle deck, the master must ensure that ventilation machinery is operating.

### 2 Lighting

Lighting of the vessel must comply with the following:

- (a) there must be illumination of at least:
  - (i) 10 lux on each access route; and
  - (ii) 20 lux on any accommodation ladder, gangway or ladder that provides access to the vessel;
- (b) there must be at least 50 lux in any working area that is illuminated by shipboard lighting;
- (c) the level of light in adjacent areas must be reasonably uniform;
- (d) any artificial illumination must be arranged so that glare and dazzle is minimised and there are no heavy shadows that may conceal a danger in cargo handling or access.

*Note* Additional guidance on measuring illumination is contained in AS/NZS 1680.1:2006 *Interior and workplace lighting — General principles and recommendations* as in force on 1 January 2017.

### 3 Protective fencing — open hatchways

- (1) An open hatchway that is a permanent fixture must be securely fenced in accordance with clause 8 if the hatchway is not:
  - (a) entirely surrounded by coamings at least 750 mm high; or
  - (b) otherwise inaccessible.
- (2) The intermediate rail mentioned in paragraph 8(c) is not required if the hatch coaming is between 400 mm and 750 mm high.
- (3) Fencing is not required for the side of a hatchway if fencing is fitted between the hatchway corners and the side of the vessel.

### 4 Protective fencing — upper decks

- (1) All upper decks to which persons have access for loading or unloading must be securely fenced on each outer edge with a bulwark or guardrails at least 1 m above the deck and designed, constructed and placed to prevent a person from accidentally falling overboard.

- (2) The bulwark or guardrails must be continuous, although sections may be removed for a loading or unloading operation to the minimum extent necessary for that purpose.

*Note* For guidance on access and safety within working areas above deck — see sections 7.6.1 and 7.8.2 and Figure 8 of the ILO Code.

## **5 Deck cargo**

If cargo or material handling equipment is stowed on an upper deck of a vessel next to a bulwark, guardrail or hatch coaming in a position where a person may require access for loading or unloading, and the bulwark, rail or hatch coaming is not of sufficient height to prevent the person from falling overboard or into an open hold, there must be temporary fencing that complies with clause 8.

## **6 Protective fencing — cargo spaces**

- (1) Any cargo space where there is a risk of a person falling a distance of at least 2 m must be fenced in accordance with clause 8.
- (2) A mechanical stowing appliance must not be used in any cargo space where an unprotected opening exists into which the appliance could fall.

## **7 Protective fencing — machinery moving parts**

Moving parts of machinery, steam pipes and live electrical conductors in or next to areas on a vessel where loading or unloading is being carried out must be guarded, fenced or otherwise enclosed so that they are not a hazard.

## **8 Temporary fencing**

Temporary fencing must:

- (a) have at least 2 parallel rails, ropes or chains; and
- (b) have a top rail, rope or chain that is at least 1 m above and substantially parallel to the walking surface; and
- (c) have an intermediate rail, rope or chain that is about midway between the top rail, rope or chain and the walking surface; and
- (d) if constructed of rope or chain — have means for keeping the rope or chain as taut as practicable; and
- (e) be continuous, apart from any section that is removable for the purpose of loading or unloading to the minimum extent necessary for that purpose; and
- (f) if it encloses a hatchway — be supported by metal stanchions that:
- (i) are spaced not more than 2.5 m apart; and
- (ii) if fitted into sockets in the deck — have a securing device that ensures each stanchion stays vertical and cannot be accidentally displaced.

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## Schedule 2 Access on board vessels

(subsection 15(2))

### 1 Requirement for access to enclosed cargo spaces

Any cargo space that has a depth of at least 1.5 m from the level of the uppermost deck of the space to the bottom of the space must have at least 1 unobstructed means of access from the uppermost deck of the space to the level where the loading or unloading is to take place.

### 2 Access openings

- (1) Access to an enclosed cargo space must include an access opening and an adjacent permanent ladder, both:
  - (a) clear of the hatchway through which cargo is loaded or unloaded; and
  - (b) located so that a person using the access will not enter the operating area directly below the cargo hatchway.
- (2) An opening for access to an enclosed cargo space must:
  - (a) be:
    - (i) for a vessel built before 1 August 1998 — at least 550 mm by 550 mm; or
    - (ii) in any other case — clear of all obstructions by at least 600 mm by 600 mm within the coaming; and
  - (b) continue to the deck or platform below on an axis parallel to the ladder; and
  - (c) have fittings beside the opening that provide a secure handhold and foothold for persons using the opening.

### 3 Access covers to enclosed cargo spaces

A cover or closing appliance fitted to an access to an enclosed cargo space opening must be securable in the open position.

### 4 Coamings where fitted to allow access to enclosed cargo spaces

- (1) If a coaming fitted to an access opening is more than 450 mm above the deck, 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) at least 300 mm wide; and
    - (ii) with tread depth for a step, or clearance from the coaming for a rung or cleat, of at least 150 mm; and
  - (c) spaced at equal intervals corresponding to the steps or rungs of the access ladder; and
  - (d) constructed to prevent slipping.
- (2) For a coaming that is more than 900 mm above the deck, there must be steps or cleats outside the coaming suitable for use by a person climbing over the coaming to enter or leave the hatch.

**5 Access in bulk carriers**

- (1) If bulk cargo is to be loaded into or unloaded from a cargo space, there must be means for a person to escape from the cargo space in an emergency.
- (2) In a bulk carrier, a cargo space requiring personnel access for loading or unloading must have:
  - (a) a means of access that complies with:
    - (i) clause 1, if the conditions mentioned in clause 1 apply; and
    - (ii) clauses 2, 3, 4 and 9; and
  - (b) for a vessel built after 16 November 1986 — a second means of access that may be:
    - (i) an inclined ladder; or
    - (ii) a series of staggered vertical ladders linking landing platforms.

**6 Access in cellular container vessels**

- (1) The means of access to an enclosed cargo space in a cellular container vessel must be an inclined ladder or a series of staggered vertical ladders fitted between adjacent transverse webs or stringers that serve as platforms or passageways.
- (2) Each ladder must be no more than 6 m long.
- (3) A passageway between ladders must be at least 600 mm wide.

*Note* For guidance on access on hatchless container vessels — see MSC.1/Circ.1263.

**7 Access in other types of vessels**

- (1) A cargo space in a vessel constructed after 1 January 2017, other than a bulk carrier or a cellular container vessel, must have at least 2 means of access.
- (2) The means of access must:
  - (a) be arranged diagonally within the hold; and
  - (b) be separated as far apart longitudinally, and athwartships, as possible.
- (3) At least 1 means of access must comply with:
  - (i) clause 1, if the conditions mentioned in clause 1 apply; and
  - (ii) clauses 2, 3, 4 and 9.
- (4) A vessel constructed after 16 November 1986 but before 1 August 1998, other than a bulk carrier or a cellular container vessel, must comply with subclause 6.2 of Appendix 7 of *Marine Orders Part 32 Cargo Handling Equipment Issue 2*, as in force on 1 February 1998.
- (5) A vessel constructed after 31 July 1998, but before 1 January 2017, other than a bulk carrier or a cellular container vessel, must comply with subclause 7 of Schedule 2 of *Marine Order 32, issue 3 (Cargo handling equipment)*, as in force on 6 December 2011.

**8 Access to containers and lashing of containers**

- (1) Access for crew to or near the top of a container or barge stowed on a vessel for loading or unloading must be in accordance with section 7.8.3 of the ILO Code.
- (2) Container lashing devices must be uniform and compatible, with as few twistlock types as practicable, and there must be clear written instructions, in English and in the working language of the vessel, for their use.

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**9 Passageways**

- (1) A passageway, other than between ladders on a cellular container vessel, that is part of a means of access to a cargo space must be at least:
  - (a) for an entrance doorway or opening through a structural member such as a bulkhead or web-frame — 600 mm wide and 2 m high, less the height of any sill not more than 450 mm high; or
  - (b) in any other case — 600 mm wide and 2 m high.
- (2) If temporary fencing is used in a passageway, the passageway width may be reduced to 550 mm.

**10 Hatchway covers and hatchway beams**

- (1) A hatchway cover that is not mechanically operated:
  - (a) must have loose gear suitable for removing and replacing it; and
  - (b) if it is intended to be lifted by hand — must have adequate handgrips; and
  - (c) unless each hatchway cover of that part of the vessel is interchangeable — must be plainly marked to indicate the deck and hatchway to which it belongs and its position on the hatchway; and
  - (d) must, together with its hatchway beams, be in good condition, and well fitting and secure when in position.
- (2) For cargo operations conducted through a hatchway that is partially uncovered:
  - (a) the opening must allow cargo to pass through; and
  - (b) any hatchway cover beside the opening must be secured to prevent accidental dislodgment.
- (3) A hatchway cover may only be used for covering a hatchway.
- (4) A hatchway cover removed from a hatchway must be placed or secured so that it cannot fall into the hold if it is dislodged.
- (5) If cargo operations are conducted through a hatchway fitted with mechanically operated hatchway covers, the covers must be secured in the stowed position.
- (6) Any hatchway cover on which there is a mechanical stowing appliance must be able to support the axle loading of the appliance when it is handling cargo.
- (7) Cargo may be loaded on a hatchway cover only if the cover is strong enough or sufficiently reinforced to support the cargo.

**11 Permanent ladders**

- (1) A permanent ladder beside an access opening must be:
  - (a) if the vertical distance between the upper surface of adjacent decks separated vertically or between deck and the bottom of the cargo space is less than 6 m:
    - (i) a vertical ladder on which the upper end must extend at least 1 m above the opening to which it provides access; or
    - (ii) an inclined ladder; and
  - (b) if 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; and
  - (c) designed and arranged so that the risk of damage from the cargo loading or discharging gear is minimised.

- (2) For a vessel without 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 if the vertical extent of any inclined ladders connecting the vertical ladders is at least 2.5 m.

## 12 Ladder design

- (1) A permanent ladder used for access to a cargo space must comply with this Schedule.
- (2) There must be a clear area in accordance with clause 15 at the top and bottom of each section of a permanent ladder.

## 13 Vertical ladders

- (1) For a vertical ladder:
- (a) its inclination to the horizontal may be less than 65° only if it is for a sloping end of a hold in a bulk carrier and is not longer than 6 m; and
  - (b) its 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 at least 300 mm; and
  - (c) its rungs must be:
    - (i) solid metal rods with a diameter at least 25 mm; or
    - (ii) solid metal square bars with sides at least 22 mm and constructed so that 1 of the diagonals of the square is oriented vertically; and
  - (d) it must provide a secure handhold; and
  - (e) its side rails must be in a vertical plane.
- (2) For a vessel built after 1 August 1998, the vertical length between platforms outside a cargo space must not be more than 6 m.

*Example* A crane pedestal.

## 14 Inclined ladders

- (1) For an inclined ladder:
- (a) it must be inclined at not more than 65° to the horizontal; and
  - (b) its steps must be spaced at equal intervals of not more than 350 mm and not less than 250 mm with a foothold at least 450 mm wide; and
  - (c) each step must be:
    - (i) checkered steel plate with a bearing surface at least 115 mm deep and the leading edge rounded; or
    - (ii) a solid metal rod with a diameter at least 25 mm; or
    - (iii) a solid metal square bar with sides at least 22 mm and constructed so that 1 of the diagonals of the square is oriented vertically; and
  - (d) for a ladder with metal bar steps — it must have at least 2 parallel bars arranged on the same horizontal plane, with the distance between the centres of adjacent bars at least 65 mm and not more than 75 mm; and
  - (e) its side rails must be in a vertical plane; and
  - (f) it must be fitted on each side with:
    - (i) a metal handrail of at least 25 mm diameter; or

- (ii) a suitably tensioned steel wire rope of at least 8 mm diameter encased in PVC tubing of at least 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, with the horizontal distance separating the handrails at least 550 mm and not more than 750 mm.
- (2) For a vessel built before 1 August 1998, an inclined ladder with steps that do not comply with paragraph (1)(d) may continue to be used if the gap between adjacent bars of any step is at least 50 mm and not more than 75 mm.  
*Note* Any replacement ladder would have to comply with paragraph (1)(d).
- (3) An inclined ladder may be arranged in the form of a spiral stairway and must comply with subclause (1) with the following modifications:
  - (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;
  - (b) 1 rail only, on the outer perimeter of the spiral, need be fitted.

## 15 Clearances

The following rules apply for clearances:

- (a) there must be a clear space of 760 mm by 760 mm in front of each rung of a vertical ladder with no obstructions intruding into the space;
- (b) however, the space may be reduced to 600 mm by 600 mm in a trunked accessway;
- (c) any obstruction (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 must be plated over or otherwise protected;
- (d) a lamp fitting in a trunked accessway must be sited in corners only, with minimum possible projection;
- (e) the clearance behind the ladder must be at least 150 mm from the centre of the tread or the rung;
- (f) there must be at least 75 mm for hand clearance on each side of the ladder and around vertical hand grips;
- (g) access space in front of the rungs of an inclined ladder must be at least 1850 mm measured vertically above the centre of each step;
- (h) there must be a gap of 35 mm behind the tread to minimise build up of material that may impair the foothold.

## 16 Landing platforms

- (1) A landing platform must comply with this Schedule and be spaced not more than 6 m apart vertically on vertical or inclined ladders.  
*Note* This does not apply to a spiral stairway.
- (2) A vertical ladder must be fitted so that:
  - (a) the upper end of each section of ladder extends at least 1 m above, and provides access to, a platform displaced to the side of the ladder; or
  - (b) there are 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.

*Note* Hand grips, or additional hand grips, may be displaced to the side of the ladder stiles if this will help persons transferring between ladder and platform.

- (3) There must be a landing platform in accordance with subclause (1) if 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 a section of a ladder terminates at a working deck (ie a deck in a space where cargo is designed to be stowed or handled) or bottom of the space.
- (4) A landing platform must:
- (a) be at least 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 a door opening onto a platform would unduly restrict the available space; and
  - (b) have a surface of a non-slip construction; and
  - (c) be fitted with a rigid handrail 1 m above the platform surface and an intermediate rail about midway between the top rail and the platform on each side, other than where there is a ladder; and
  - (d) be fitted with a toe board at least 100 mm above the walking surface around the periphery of the platform, other than where there is a ladder; and
  - (e) have a head clearance of at least 2 m measured vertically above the surface of the platform.

*Note* For a vessel built before 1 January 2015 — see section 32.

## 17 Crane operator's cabin

The cabin of a crane that is not fitted with remote controls in accordance with clause 6 of Division 3 of Schedule 6 must:

- (a) give the operator, from the operating position of the crane, a clear and unrestricted view of the load and area of cargo operations or of a person directing cargo operations; and
- (b) for any window that normally gives the operator, from the operating position of the crane, a view of the load and area of cargo operations or of a person directing cargo operations — have a device that effectively clears rain or moisture; and
- (c) give the operator ready access to the operating position and to all necessary controls and switches; and
- (d) be adequately heated in cold weather by means that do not emit noxious or objectionable fumes; and
- (e) be adequately ventilated by mechanical means; and
- (f) be equipped with a suitable seat and, if necessary, footrests;
- (g) if fitted with an access door:
  - (i) allow the door to be operated from both inside and outside the cabin; and
  - (ii) have an opening at least 550 mm wide and 1850 mm high (including any sill up to 450 mm); and
  - (iii) if the type of door may prevent rescue in an emergency — allow access to the cabin through a second opening; and
- (h) be constructed of fire-proof materials; and

- (i) for an electrically operated crane or a crane in which electrical equipment connected with the crane's operation is installed — have a fire extinguisher that complies with the Australian Standard or an international equivalent; and
- (j) shield the operating position and seat from the effects of radiated heat from the driving mechanism; and
- (k) if the crane can hoist a load to the level of the operating position — have 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
- (l) have illumination operable from the control position.

## **18 Access to crane operating position**

- (1) Access to the operating position of a crane must be by:
  - (a) a spiral stairway ladder; or
  - (b) an inclined ladder or ladders; or
  - (c) a vertical ladder or ladders; or
  - (d) any combination of spiral stairway, inclined or vertical ladders.
- (2) For an access opening in a crane pedestal:
  - (a) the top of the opening must be at least 1850 mm above the deck; and
  - (b) any sill must not be more than 450 mm high; and
  - (c) it must have a clear width of at least 550 mm.
- (3) If the access is inside the structure of the crane or crane pedestal:
  - (a) there must be an emergency escape, outside the structure, at least 550 mm by 550 mm to allow descent to a safe surface in any position the crane may stop; or
  - (b) there must be:
    - (i) no machinery sited in the access way; and
    - (ii) lighting for the access route; and
    - (iii) sealed metal conduit that contain any electrical wiring in the access way, other than for light fittings; and
    - (iv) properly secured metal boxes that contain any electrical equipment in the access way.

### *Example 1*

An appropriate safe escape provision may 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 Australian 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 an inspector 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.

- (4) There must be written instructions for use of the means of escape in the cabin.
- (5) A vertical external access ladder that is at least 3 m long, or 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 have a ladder cage that would substantially prevent the fall if:
  - (a) the vessel's structure does not provide equivalent protection; or
  - (b) it is not an emergency escape ladder.
- (6) For subclause (5), the ladder cage must have cage hoops and longitudinal strips of adequate strength fitted as follows:
  - (a) cage hoops uniformly spaced at intervals up to 900 mm, so that:
    - (i) any of the following:
      - (A) if the top of the ladder ends at the edge of a platform or deck — the topmost cage hoop is attached to the upper guard-rail;
      - (B) if the top of the ladder ends at an access opening in a platform or deck — the topmost cage hoop is fitted just below the level of the platform;
      - (C) if the cage longitudinals are secured to the platform or deck — the topmost hoop may be sited within 900 mm below the platform or deck;
    - (ii) the lowest cage hoop is at least 2 m and not more than 2.2 m above the deck or platform beside 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) clear internal width of at least 550 mm and maximum clearance between the ladder rungs and the back of the cage of at least 750 mm;
  - (e) the hoops and strips must not hinder use of the ladder rungs or handholds.
- (7) A platform on a crane must be adequate for the purpose and must comply with this Schedule other than subclause (9).
- (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.
- (9) A walkway or platform providing access around or along a crane must:
  - (a) be at least 550 mm wide; and
  - (b) provide safe access to and from the crane at any operating angle of luff or slew of the crane.

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- (10) A ladder giving access to the operator's position of a crane must be not be located over any access opening in the floor of a platform or walkway in the stowed position of the jib or the normal parked position of the crane.
  - (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.
  - (12) Subclause (11) applies to a crane:
    - (a) installed on a vessel built after 11 August 1997; or
    - (b) on which an existing cover is replaced.
  - (13) Subclauses (1), (2), (5), (6), (7), (8), (10), (11) and (12) do not apply to a derrick crane.
  - (14) Subclause (3) and (9) apply to a derrick crane to the extent that its application is relevant and practical.
  - (15) A crane installed on a vessel before 17 November 1986 must comply with subclause (3) to (10) to the extent that it is technically practicable.

## **19 Weather protection**

There must be adequate weather protection for the driver at each winch operating position.

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## Schedule 3 Testing and examination procedures

(subsections 22(2), 23(1), 24(1) and 30(1))

### 1 General

An examination mentioned in this Schedule must be carried out in accordance with section 4.2.4 of the ILO Code.

### 2 Items other than wire and fibre ropes, nets and slings

- (1) Material handling equipment for use in loading or unloading a vessel must be tested and examined:
    - (a) before being used for the first time; and
    - (b) after repair of any stress bearing component.
  - (2) Material handling equipment for use in loading or unloading a vessel must be tested and examined at intervals of at least every:
    - (a) 5 years by a competent person; and
    - (b) 12 months by:
      - (i) for equipment under survey with a recognised organisation — a competent person; and
      - (ii) in any other case — a responsible person.
  - (3) Subclauses (1) and (2) do not apply to:
    - (a) an intermediate bulk container that:
      - (i) has permanently attached fittings for handling; and
      - (ii) is designed and constructed as a container; and
      - (iii) has been type tested in accordance with the IMDG Code; or
    - (b) a mechanical stowing appliance solely for use on the vessel.
  - (4) Paragraph (2)(a) does not apply to:
    - (a) loose gear; or
    - (b) an item of equipment that is permanently attached to a lifting appliance.
- Examples*
- a lower cargo block, a ponder ball or a cargo hook dedicated to use with a specific lifting appliance and forming part of the assembly.
- (5) An examination for subparagraph (2)(b)(i) may be postponed for 3 months if:
    - (a) it will enable the examination to be carried out with a scheduled annual class survey of the vessel; and
    - (b) a responsible person:
      - (i) carries out an examination before the due date of the annual inspection and considers that the equipment is satisfactory; and
      - (ii) enters details of the examination on the register of material handling equipment.
  - (6) If a competent person considers that specialised material handling equipment cannot reasonably be tested in accordance with this Schedule or the equipment

would require unnecessary dismantling, the requirements in subclause (2) do not apply if:

- (a) the manufacturer's equipment specification, schedule of examination and maintenance manual are available to the competent person; and
- (b) the equipment has been examined and maintained in accordance with the maintenance manual and recorded in the register of material handling equipment.

### 3 Cranes and derricks — proof load

- (1) The proof load of a crane or derrick may be less than the load mentioned in Table 1 for the crane or derrick only if:
  - (a) for a hydraulic crane — it is tested in accordance with paragraph 2(1)(b) or 2(2)(a); and
  - (b) it is not practical for the crane to raise the full test load; and
  - (c) the reduced test load is at least SWL x 1.1.

**Table 1**

SWL of derrick gear or crane (tonnes)	Proof load
≤ 20	SWL × 1.25
> 20 and ≤ 50	SWL + 5 tonnes
> 50	SWL × 1.1

- (2) A derrick rigged in union purchase must be rigged in accordance with the rigging plan mentioned in clause 1 of Division 1 of Schedule 6, with a proof load based on the SWL mentioned in the plan.
- (3) For 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 the part by more than the proportion by which the proof load exceeds the SWL of the crane or derrick.
- (4) The proof load for a test of a crane, including a derrick crane, a derrick in union purchase or the initial test of a derrick, must be applied by hoisting movable weights.
- (5) 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, a spring, hydraulic balance or similar appliance.
- (6) The proof load must be applied:
  - (a) with the derrick boom or crane jib at its minimum working angle or, for a crane or derrick crane, its load radius, measured from the horizontal plane and stated in the certificate of test; or
  - (b) for 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.

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#### 4 Cranes and derricks — testing

- (1) If 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 each end of its slewing arc; and
  - (b) for 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) for 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 end of the traversing span, and again, with the hoist at the other end; and
  - (d) for a bridge or gantry crane without a travelling capability — the crane must be made to move the weights from one end of its traversing span to the other; and
  - (e) for a derrick crane — the derrick crane must 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) If a derrick or crane is tested with a spring, hydraulic balance or similar appliance, the proof load must be applied in its midship position for at least 5 minutes at the minimum working angle at each end of its working arc.
- (3) A crane must undergo an operational test, including testing of its limit switches, using its full range of speeds and by hoisting a load at least equal to the SWL while carrying out all motions occurring in normal operations including hoisting, luffing, slewing and travelling.
- (4) For testing derrick gear in union purchase, the proof load must be manoeuvred, with the gear rigged over the opposite side of the ship, 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 less than 120°; or
  - (b) a lesser angle mentioned in a drawing mentioned in Schedule 6,
- (5) After testing the crane or derrick:
  - (a) it must be examined by a competent person for damage or permanent deformity; and
  - (b) the overload limit switches must be reset.

#### 5 Winches

- (1) 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 making each sprocket subject to the resultant load.
- (2) After the proof load test, each winch must be tested with a load equal to the SWL suspended from the derrick head, and the derrick placed in various positions so that each winch is subjected to loading while having the maximum working length of rope layers on its drum.
- (3) After the proof load test, the following must be completed in sequence:
  - (a) a load equal to the SWL for the derrick must be hoisted;

- (b) with the derrick slewed outboard to each side of the vessel and with the derrick amidships lowered at the normal lowering speed of the winch for 3 m, the winch must be braked sharply and the load brought to a halt;
- (c) the load must be held stationary by the winch brake when the winch drive is switched off.

## 6 Cargo lifts and mechanical ramps

- (1) If a cargo lift or mechanical ramp is tested, the proof load must be at least the load mentioned in Table 2 for the lift or ramp.

**Table 2**

SWL of lift or ramp (tonnes)	Proof load
$\leq 20$	$SWL \times 1.25$
$> 20$ and $\leq 50$	$SWL + 5$ tonnes
$> 50$	$SWL \times 1.1$

- (2) For testing, a cargo lift or mechanical ramp must be hoisted and lowered through its full range of travel with the proof load holding movable weights distributed in accordance with designed operating requirements.
- (3) After testing, a cargo lift or mechanical ramp and its accessory gear must be examined by a competent person for damage or permanent deformities.

## 7 Blocks, chains, rings, hooks, shackles, swivels, connecting plates, overhauling weights

- (1) The proof load for a single sheave block is 4 times the block's SWL.
- (2) For testing:
  - (a) the block must be suspended head down by a wire, or chain if a chain block, passing around its sheave; and
  - (b) a mass of 4 times the SWL must be secured to the head fitting of the fitting and lifted from the ground; and
  - (c) for a single sheave block 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.
- (3) However, the test may be carried out in another way if the same stress is applied to the block.
- (4) For testing a multiple sheave block:
  - (a) the proof load must be at least the load mentioned in Table 3 for the block; and
  - (b) it must be reeved in its normal operating condition; and
  - (c) the proof load must be applied to the head fitting of the block to be tested.

*Note* Testing a multiple sheave block usually requires the use of a second block or an equivalent arrangement for the rope.

**Table 3**

SWL of block (tonnes)	Proof load
$\leq 25$	$SWL \times 2.0$
$> 25$ and $\leq 160$	$(SWL \times 0.933) + 27$ tonnes
$> 160$	$SWL \times 1.1$

- (5) If a chain, ring, hook, shackle, swivel, connecting plate or overhauling weight is tested, the proof load must be at least the load mentioned in Table 4 for it.

**Table 4**

SWL of article (tonnes)	Proof load
$\leq 25$	$SWL \times 2$
$> 25$	$(SWL \times 1.22) + 20$ tonnes

- (6) For a hand operated block used with pitched chains, its associated chains and any permanently attached rings, hooks, swivels or associated shackles must be tested:
- with a proof load of at least 1.5 times SWL; or
  - with the articles mentioned in subclause (1), (2) or (5).
- (7) After testing an article mentioned in subclause (1), (4), (5) or (6), the article must be examined by a competent person for damage or permanent deformities.

*Examples of other damage or permanent deformities*

a crack or flaw to a block, the head fitting, sheave or sheaves, axle, crosshead, becket or other part.

## **8 Trays, crates, tubs, grabs, scrap bins, other receptacles for loading or unloading cargo**

- (1) If a tray, crate, tub, grab or other receptacle for use in loading or unloading cargo, other than a container or returnable cargo unit mentioned in clause 14 or 15, is tested, the proof load must be:
- at least the load mentioned in Table 5; and
  - wholly supported by the bottom surface of the receptacle.

**Table 5**

SWL of article (tonnes)	Proof load
$\leq 3$	$SWL \times 2$
$> 3$ and $\leq 12$	$SWL + 3$ tonnes
$> 12$ and $\leq 20$	$SWL \times 1.25$
$> 20$	$SWL + 5$ tonnes

- (2) After testing the article, it must be examined by a competent person for permanent deformation or other damage or defects.

## 9 Lifting beams, spreaders, lifting frames, magnetic lifting devices and vacuum lifting devices

- (1) If a lifting beam, spreader, lifting frame, magnetic lifting device or vacuum lifting device is tested, the proof load must be:
  - (a) at least the load mentioned in Table 6 for it; and
  - (b) attached in the way for which the article is designed.

**Table 6**

SWL of article (tonnes)	Proof load
$\leq 10$	$SWL \times 2$
$> 10$ and $\leq 160$	$(SWL \times 1.04) + 9.6$ tonnes
$> 160$	$SWL \times 1.1$

- (2) After testing the article, it must be examined by a competent person for damage or permanent deformation.

## 10 Wire ropes — testing

- (1) A sample of manufactured wire rope to be used in loading or unloading must be tested to destruction in accordance with AS 3569-2010 *Steel Wire Ropes — Product specification*, as at the date of amendment by *AS 3569-2010/Amdt 1-2012*, or equivalent international standard.
- (2) The safe working load for a wire rope is:

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

where:

*safety factor* is:

- (a) at least:

$$\frac{10\,000}{(SWL \times 8.85) + 1910}; \text{ and}$$

- (b) for a SWL up to 10 tonnes — no greater than 5; and
- (c) for a SWL of at least 160 tonnes — at least 3.

## 11 Wire ropes — inspection

- (1) An inspection of wire rope must be made by a responsible person at intervals of not more than:
  - (a) if the wire rope does not pass over a sheave or a winding drum — 12 months; or
  - (b) if the wire rope passes over a sheave or winding drum — 6 months.
- (2) The responsible person must inspect the rope externally and, as far as practical, internally to determine whether the rope is worn, corroded or defective to an extent that makes it unfit for the proposed use.
- (3) A wire rope may be used only if:
  - (a) a competent person has issued a certificate for the rope; and

- 
- (b) a responsible person has, immediately before its initial use, inspected the rope in accordance with subclause (2); and
  - (c) the rope is free from knots and kinks; and
  - (d) the rope complies with the structural requirements mentioned in Schedule 4; and
  - (e) evidence, based on prototype testing, that any terminal or end fitting on the rope complies with clause 12 is recorded in the register of material handling equipment.
- (4) A rope in which a constituent wire is broken may be used only if:
- (a) it has been inspected in that condition by a competent person before its initial use; and
  - (b) the competent person is satisfied that:
    - (i) no more than 5% of visible wires in a length of the rope that is 10 times its diameter are broken; and
    - (ii) there is no more than 1 broken wire beside any compressed metal ferrule; and
  - (c) the competent person has entered the details of the inspection in the register of material handling equipment; and
  - (d) it is inspected monthly by a responsible person and the details of the inspections entered in the register of material handling equipment; and
  - (e) the responsible person has determined that it remains fit for use.

*Note for paragraph (b)* See section 5.3.3.3 of the ILO Code.

## **12 Terminal or end fittings**

- (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 for which prototype tests have shown that the strength of the terminal and its attachment to the rope is at least:
  - (a) for a rope up to 50 mm in diameter — 95% of the minimum breaking load of the rope; or
  - (b) for a rope more than 50 mm in diameter — 90% of the minimum breaking load of the rope.
- (2) Subclause (1) does not apply if the equipment is under survey and inspection under a scheme of classification and certification by a recognised organisation.
- (3) For each terminal, end fitting or set of identical terminal or end fittings, there must be a certificate specifying its type and size, the type and size of wire rope to which it was fitted, and the result of the test mentioned in subclause (1).

## **13 Fibre ropes and flat-synthetic webbing slings**

- (1) A samples of manufactured fibre rope must be tested to destruction in accordance with AS 4143.1-1993 *Methods of Test for Fibre Ropes* as in force on 1 January 2017.
- (2) Fibre rope supplied to a vessel for loading and unloading purposes must have a certificate.

- 
- (3) The SWL mentioned in the certificate is:
- $$\frac{\text{minimum breaking tensile load of sample}}{\text{safety factor}}$$

where:

**safety factor** is at least the amount mentioned in table A1 of Australian Standard AS 4142.1-1993 Fibre ropes — Care and safe usage as in force on 1 January 2017 or in Appendix E of the ILO Code.

- (4) Material, design, manufacture, marking, testing and certification of flat synthetic-webbing slings must comply with:
- (a) AS 1353.2-1997 *Flat Synthetic Webbing Slings Part 2: Care and use*, as in force on 1 January 2017; or
  - (b) Appendix E of the ILO Code.

*Note* Standards mentioned in this clause will be made available for viewing free of charge at AMSA offices on request — see note 1 under section 4.

#### **14 Intermediate bulk containers**

An IBC must be certified in accordance with the IMDG Code.

#### **15 Other returnable cargo units**

For a type test of a returnable cargo unit:

- (a) the proof load must be at least SWL x 5; and
- (b) there must be no loss of contents from, or breakage or serious deformation of, the unit.

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## Schedule 4 Requirements for material handling equipment

(subsection 22(1), paragraph 11(3)(d) of Schedule 3)

### 1 Chains

- (1) A chain used in loading or unloading must:
  - (a) not be knotted; and
  - (b) for slinging a heavy load of iron or steel — have packing material to prevent:
    - (i) damage to the chain from direct contact with any sharp edge of the load; and
    - (ii) slipping of the load because of a low coefficient of friction between chain and load.
- (2) Subparagraph (1)(a)(ii) does not apply if:
  - (a) a chain sling is used with a spreader bar so that the load is substantially horizontal when hoisted; and
  - (b) the chain is made of higher tensile alloy steel.

*Examples of higher tensile alloy steel*

quality grade S or T steel mentioned in AS 2321-2014 *Short-link chain for lifting purposes* as in force on 1 January 2017.

### 2 Wire rope

- (1) A wire rope used in loading or unloading must:
  - (a) have no knots or kinks; and
  - (b) if it is not for use as a guy pendant, a preventer guy, a stay or a net or sling:
    - (i) have at least 114 constituent wires; and
    - (ii) use any fibre material in its construction only for strand or rope core; and
  - (c) for a runner or purchase — be a continuous length without joins; and
  - (d) only have any thimble or loop splice fitted to the rope that complies with Schedule 8.
- (2) A wire rope grip may be used only in standing rigging, including attachment to the drum.

### 3 Slings and nets

- (1) A sling or net used in loading or unloading must:
  - (a) be made of chain, wire rope, woven synthetic webbing, woven steel webbing or fibre rope; and
  - (b) for a sling other than an endless sling — be fitted with eyes, rings, links or shackles that provide safe connection to a lifting hook; and
  - (c) for a fibre rope sling or net — have each splice of at least 4 tucks of strands; and
  - (d) be prevented from being damaged by sharp edges on loads.
- (2) An expendable or disposable sling must be discarded after use.

#### 4 Hooks

A hook used in loading and unloading must be:

- (a) constructed to prevent displacement of the load from the hook; or
- (b) fitted with a device to prevent a load from becoming detached.

#### 5 Lifting devices

- (1) A container lifting frame, used in loading or unloading, that is on board a vessel and fitted with twistlocks must be fitted with a device that:
  - (a) indicates whether or not the twistlocks are in the locked position; and
  - (b) prevents the frame, if attached to a container, from being hoisted if any twistlock is not in the locked position.
- (2) A vacuum lifting device, used in loading or unloading, that is on board a vessel must:
  - (a) be fitted with a gauge, or other instrument, marked to indicate the least vacuum at which the device may be used with safety, that indicates the state of the vacuum; and
  - (b) automatically give audible warning if:
    - (i) the vacuum is not more than 80% of its operating value; or
    - (ii) the vacuum-inducing pump stops operating; and
  - (c) be fitted with equipment that, if the vacuum-inducing pump fails, will maintain sufficient vacuum to support the safe working load of the device for enough time for the load to be lowered from the maximum height of lift to a safe location.
- (3) A magnetic lifting device used in loading or unloading must have an alternative power supply that comes into immediate operation if the main power fails.

#### 6 Pallets

A pallet must conform with ISO 6780:2003 *Flat pallets for intercontinental materials handling — Principal dimensions and tolerances* as in force on 1 January 2017 or an equivalent standard that operates in the country in which the vessel is registered.

#### 7 Prescribed markings — safe working load

- (1) An article of loose gear used in loading or unloading must have:
  - (a) for 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 marked on it; and
  - (b) for a sling that is purpose-designed for a particular load — the safe working load for the sling in its designed operating alignment marked; and
  - (c) if 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 marked on it; and

- (d) if 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 marked on it.

*Note for paragraph (a)* The SWL marked on a multi-legged sling should be:

- (a) for a 2-legged sling, the SWL when the included angle between the legs is 90°; and
  - (b) for a 3-legged sling, the SWL when the included angle between any 2 legs is 90°; and
  - (c) for a 4-legged sling, the SWL when the included angle between any 2 diagonally opposite legs is 90°.
- (2) However, the safe working load does not have to be marked for natural fibre ropes and rope slings.

## **8 Prescribed markings — distinguishing mark or number**

- (1) An article of loose 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.
- (2) The article may be identified by using a batch mark or number, if that mark is verified by a test certificate.

## **9 Prescribed markings — method of marking**

An article of loose gear must be marked:

- (a) in a form that is durable; and
- (b) either:
  - (i) directly on the article in a place and in a way that will not cause stress in the article; or
  - (ii) if the material is too hard to accept marking or direct marking would be likely to affect the safe use of the article — by marking a tablet or disc permanently attached to the article.

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## Schedule 5 Safe use of material handling equipment

(section 21)

### 1 Maximum permissible load

Material handling equipment may be subjected to a load greater than its SWL only if:

- (a) it is under test; or
- (b) it is a single sheave block rigged as a double whip or gun tackle so that the load is suspended from its head fitting, loaded to not more than twice the SWL marked on the block; or
- (c) it is a crane or derrick that meets all of the following requirements:
  - (i) it is performing an occasional lift not in the course of normal operations;
  - (ii) the SWL is not more than 50 tonnes, or the crane or derrick is classed by a recognised organisation that concurs with the overloading;
  - (iii) the load is inspected by a competent person who is satisfied that the crane or derrick and its associated equipment is fit to carry the load;
  - (iv) the competent person agrees that the operation can proceed;
  - (v) the master or the owner gives permission in writing;
  - (vi) the load does not exceed the proof load for the crane or derrick gear.

*Note for paragraph (b)* For guidance on the marking and SWL of single sheave blocks — see section 4.4.5 and Appendix H of the ILO Code.

### 2 Use of 2 lifting appliances to lift a load

- (1) If the manufacturer's operating procedures for tandem lifting are on board a vessel and the procedures allow it:
  - (a) a tandem crane may lift its combined SWL; and
  - (b) 2 identical cranes used in tandem may lift their combined SWL.
- (2) If there are no manufacturer's operating procedures for tandem lifting, or the procedures are not on board the vessel:
  - (a) a tandem crane must not exceed the SWL of either crane by more than 25%; and
  - (b) 2 identical cranes used in a tandem lift must not exceed the SWL of either crane by more than 25%.

*Note* For guidance on the use of a tandem crane — see section 5.2.6 of the ILO Code.

### 3 Roll-on/roll-off operations

- (1) A vessel being loaded or unloaded by the roll-on/roll-off method must have on board and available to the master of the vessel:
  - (a) details of:
    - (i) the maximum total load; and
    - (ii) the maximum axle loadings; and
    - (iii) the maximum wheel loadings permitted on decks, internal ramps and cargo lifts; and

- (b) an instruction manual, in English, for each vehicular access ramp between the vessel and the shore, including:
    - (i) permitted tidal, list and trim conditions for the vessel; and
    - (ii) the number and spacing of vehicles, and maximum loadings, for which the ramp is designed; and
    - (iii) details of vehicle weights, axle loadings, disposition of loads, tyre print dimensions and number and spacing of wheels; and
  - (c) details of material handling equipment, including their ability to negotiate ramps.
- (2) A ramp must not be used when tidal or list or trim conditions exceed those stated for subparagraph (1)(b)(i).
- (3) A ramp between vessel and shore, used in roll-on/roll-off loading or unloading, must:
- (a) have a surface that is:
    - (i) suitable for use by wheeled vehicles; and
    - (ii) of non-slip material or construction; and
    - (iii) free of slippery substances; and
  - (b) have barriers to prevent a vehicle falling or being driven off the edge; and
  - (c) connect with shore in a way that is safe considering movement of the tide and vessel; and
  - (d) for a ramp that gives pedestrian access — have a gradient of less than 1 in 10; and
  - (e) for a ramp that has more than 1 lane of traffic — have the direction of traffic flow indicated in each lane.
- Note* For guidance on roll-on/roll-off operations — see section 7.2.9 of the ILO Code.
- (4) For subsection (3), the gradient of the ramp may be more than 1 in 10 only if:
- (a) the ramp is used only for loading or unloading motor vehicles; or
  - (b) operating instructions for mechanical stowing appliances used on the ramp allow for the steeper slope.
- (5) A stanchion, pillar or any other part of the vessel's structure that could be an obstruction must be clearly marked in contrasting colours.

#### **4 Cargo lifts and mechanical hoists**

A cargo lift or mechanical hoist used for loading or unloading must have audible and visible warning signals that:

- (a) commence before the lift or hoist begins motion; and
- (b) continue during motion.

#### **5 Shipborne barges**

A shipborne barge may be loaded on or unloaded from a vessel only if it:

- (a) is constructed in accordance with the requirements of a recognised organisation; 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 of the recognised organisation.

**6 Securing of shackles**

Shackles or other devices used with a crane or derrick gear must be secured if they are situated aloft and are not readily accessible.

**7 Use of wrought iron**

Material handling equipment used in loading or unloading, either directly or indirectly, must not be made of wrought iron.

**8 Use of grabs**

A grab intended for use in loading or unloading bulk cargoes and that is to be attached to a vessel'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.

## **Schedule 6 Derricks and cranes used for loading or unloading**

(subsection 22(1), clause 17 of Schedule 2, subclause 4(4) of Schedule 3)

### **Division 1 Derricks**

#### **1 Drawings and instructions**

The master must keep on board the vessel a rigging plan, drawings and instructions for the use of any derrick used in loading or unloading.

#### **2 Use of stays**

For a derrick used in loading or unloading, any stay, including a backstay or preventer stay, that counteracts a load on a mast or derrick post, other than a stay that must be disconnected to enable loading or unloading operations, must be fitted correctly and be taut and secure during loading and unloading.

#### **3 Securing guys in way of deck cargo**

If deck cargo is stowed against and above a vessel's rail or bulwark, there must be a wire rope pendant or chain, extending from a ring bolt or other anchorage on the vessel, that:

- (a) is long enough for derrick guys and preventers to be attached without the need for a person, engaged in loading or unloading, to go overside; and
- (b) has a safe working load of at least the safe working load of the derrick guy or preventer to which it is attached.

#### **4 Permanent attachments to a derrick**

All permanent attachments to a derrick used in loading or unloading, including any ring bolt, eyebolt, padeye, lug, band or heel connection or fitting, must be strong enough to support the maximum load, as set out in the rigging plan, drawings or instructions for the use of the derrick, that may be imposed on the attachment.

#### **5 Securing guys to a derrick**

- (1) Each guy, guy block or preventer guy used in loading or unloading must be secured to a derrick at a permanent attachment, with no more than 1 connection to each attachment.
- (2) However, for a preventer guy, an eye that has been formed in 1 end by splicing may be placed around the derrick head so that it will not be dislodged during loading or unloading.

#### **6 Restriction of movement of heel blocks**

A derrick heel block that is subject to movement in the vertical plane between load and no-load positions must be fitted with a device that constrains the movement consistent with safe operation.

## 7 Securing runners

A runner used in loading or unloading must be attached to the winch drum:

- (a) so that no part of the runner is damaged; and
- (b) by means other than fibre rope.

*Note 1* The method used to secure a runner to a winch should be by shackle or clamp-type socket, any of which should provide a strength equivalent to 50% of that of the runner.

*Note 2* The number of complete turns remaining on the drum of the winch if the complete working length of rope has been paid out should not be less than:

- (a) for an ungrooved drum — 3; and
- (b) for a grooved drum — 2.

## 8 Markings required

- (1) A derrick for use in loading or unloading must be marked with:
  - (a) its safe working load for each operating condition, as set out in the rigging plan, drawings or instructions for the use of the derrick; and
  - (b) the lowest angle to the horizontal at which the derrick may safely be used, as set out in the rigging plan, drawings or instructions for the use of the derrick.
- (2) The marking of the safe working load of a derrick must be:
  - (a) if the derrick is to be used as a single derrick — the letters ‘SWL’ followed by:
    - (i) numerals indicating the safe working load; and
    - (ii) letters identifying the units of mass in which the safe working load is expressed; and
    - (iii) if there is more than 1 operating condition — an oblique stroke separating the units of mass for each condition; or
  - (b) for a union purchase rig — the letters ‘SWL(u)’ followed by:
    - (i) numerals indicating the safe working load; and
    - (ii) letters identifying the units of mass in which the safe working load is expressed; and
    - (iii) if there is more than 1 operating condition in union purchase rig — an oblique stroke separating the units of mass for each condition.

*Examples of markings*

- (a) ‘SWL xt’, ‘SWL x/yt’ .
  - (b) ‘SWL(u) xt’, ‘SWL(u) x/yt’.
- (3) Markings must be placed on the derrick or on a plate near the heel of the derrick.
  - (4) The letters and numerals must be:
    - (a) at least 77 mm high;
    - (b) of proportional breadth; and
    - (c) of a light colour on a dark background or a dark colour on a light background.

## 9 Union purchase rig

A derrick used in a union purchase rig must:

- (a) be rigged in accordance with the drawings mentioned in clause 1; and

- (b) be fitted with a preventer guy of wire rope, or wire rope coupled to a length of chain, with a safe working load that is sufficient for the stresses on the derrick during loading and unloading; and
- (c) have each guy used to position the derrick kept taut during loading or unloading.

## **10 Angle between runners of union purchase rig**

If loading or unloading by a derrick 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 more than 120° or a lesser angle in accordance with the rigging plan, drawings or instructions for the use of the derrick.

## **Division 2 Cranes**

### **1 Rigging plan, drawings and instructions**

The master must keep on board the vessel a rigging plan, drawings and instructions for the use of any crane used in loading or unloading.

### **2 Limiting devices**

- (1) A crane used in loading or unloading must have a motion-limiting device that:
  - (a) prevents movement of the crane, and any load being handled, beyond the designed range of operations of the crane; and
  - (b) operates automatically; and
  - (c) for a crane other than a derrick crane — takes effect by interrupting the operating power so that the crane and its load are held stationary.
- (2) However:
  - (a) a derrick crane that does not comply with paragraph (1)(c) must be fitted with a visual or audible alarm to warn the operator when the load is approaching the limit of the crane's range; and
  - (b) for a crane installed before 17 November 1986 in which compliance for its traversing, travelling or slewing motions would be unreasonable or impracticable — it must not be operated beyond its safe limits.

### **3 Markings**

- (1) A crane for use in loading or unloading must be marked with:
  - (a) its safe working load; and
  - (b) if the safe working load varies with the outreach of the crane — the safe working load for each specified outreach.
- (2) The marking of each safe working load and outreach of a crane or derrick crane must:
  - (a) state the safe working load, including the units of mass used; and
  - (b) for a marking mentioned in paragraph (1)(b):
    - (i) numerals that indicate the number of metres of outreach followed by the letter 'm', and
    - (ii) an oblique stroke separating the information for each outreach.

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- (3) Markings must be clearly made:
    - (a) on:
      - (i) an external part of the structure of the crane; or
      - (ii) the derrick crane or a plate near the heel of the derrick crane; and
    - (b) in the driver's cabin so that it is clearly visible to the driver.
  - (4) External markings must be:
    - (a) at least 77 mm high; and
    - (b) of proportional breadth; and
    - (c) of a light colour on a dark background or a dark colour on a light background.
  - (5) If the safe working load varies with the outreach of the crane, the operator must be able to determine:
    - (a) the outreach at any time; and
    - (b) the corresponding safe working load.

#### **4 Track-mounted cranes**

- (1) A bridge or gantry crane used in loading or unloading must:
  - (a) not collapse or overturn if a wheel breaks, an axle fails or it derails; and
  - (b) be fitted with devices that lock the crane in position when exposed to wind pressure; and
  - (c) be fitted with tracks that are strong, properly laid, maintained and with stops at the ends of the trackways; and
  - (d) be electrically bonded and earthed to the vessel's structure; and
  - (e) have locking devices on overside extensions engaged; and
  - (f) if there is more than 1 crane on the same trackway — each be fitted with a device to prevent collision; and
  - (g) have any track wheels at deck level fitted with foot guards.
- (2) There must be a clear passageway at least 550 mm wide on deck between:
  - (a) the structure of a track-mounted crane and the vessel's bulwark or side rails; or
  - (b) the structure and hatch coamings.

*Example of a passage*

a catwalk attached to the structure of the crane and fitted with guard-rails

- (3) However, a vessel constructed before 17 November 1986 may have no passageway if access to the deck area over which the crane may travel is prevented.
- (4) A bridge or gantry crane must be fitted with:
  - (a) an acoustic warning device that:
    - (i) emits an audible sound before travelling motion is commenced; and
    - (ii) continues to sound until travelling motion has ceased; and
  - (b) a horn or similar acoustic warning device that can be sounded by the crane operator; and

- (c) a clearly labelled emergency stop switch that can easily be operated by persons at deck level.
- (5) If an access ladder on a track-mounted crane is located where a person using it could fall into an open cargo space or over the vessel's side, it must comply with subclauses 18(5) and (6) of Schedule 2.
- (6) However, access to the bottom of the ladder must not be impeded.
- (7) If the operator's cabin a track-mounted crane travels with the horizontal movement of a load, the structure must enable to operator to leave the cabin safely if there is a power failure or other emergency.  
*Example of an appropriate structure*  
a mobile or portable access or means of returning the cabin from the track to the point of access.
- (8) A track-mounted crane installed on a vessel before 17 November 1986 must comply with subclauses (1), (2), (5), (6) and (7) to the extent technically practicable.

## **Division 3 Controls and brakes**

### **1 Controls**

- (1) Crane and winch controls must:
  - (a) be located so that the operator in the operator's position:
    - (i) has sufficient room to operate them safely; and
    - (ii) has a clear view of the load and operation area, or of a person directing cargo operations; and
    - (iii) is clear of the load and ropes; and
  - (b) be located so the operator is not placed in the bight of the runner near the heel block of a derrick; and
  - (c) have on or next to them clear markings that indicate their purpose and mode of operation; and
  - (d) have a locking device to prevent accidental movement or displacement; and
  - (e) for a vessel constructed after 5 December 2011 — automatically return to the neutral / stop position.
- (2) Crane and winch control handles must move in the direction of the resultant load movement.
- (3) Crane and winch control wheels must rotate clockwise for winding in a rope and anticlockwise for paying out a rope.
- (4) For the full range of operations, a control must not move from the midpoint of the designed handgrip or footrest more than:
  - (a) for a hand lever — 600 mm; or
  - (b) for a foot pedal — 250 mm.
- (5) A brake pedal for a crane or winch must have a non-slip surface.

### **2 Brakes**

- (1) A winch used in loading or unloading must have a braking system that can:
  - (a) arrest the motion of each drum on which a rope is wound; and

- 
- (b) exert a restraining torque of at least 1.5 times the maximum static torque that would be transmitted to the brake by a suspended load of the maximum safe working load of the derrick served by the winch.
  - (2) When the winch is under load, each brake must be able to arrest the motion of the drum that it serves, smoothly and without snatching.
  - (3) A winch that is driven by an internal combustion engine must be constructed so that the load cannot fall by its own weight when the engine is disconnected.
  - (4) A crane used in loading or unloading must have a braking or speed-regulating system that:
    - (a) can arrest 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) for arresting the hoisting and luffing motions of the crane — can exert a restraining torque of at least 1.5 times the maximum static torque transmitted to the braking system by a suspended load of the maximum safe working load of the crane and operate automatically when the controls are in the stop position; and
    - (c) is activated automatically if the power drive or the control system fails, and allows for the load to be lowered during the failure; and
    - (d) does not allow a load to fall at a speed more than the design speed.

### **3 Electrically powered equipment**

For an electrically powered crane or winch used in loading or unloading:

- (a) the operating modes of the controls must be separated by a neutral, stop or off position; and
- (b) the braking system must come into operation automatically when there is a significant drop in the supply of electrical power; and
- (c) there must be an emergency or isolating switch that:
  - (i) is conveniently close to the operator; and
  - (ii) shuts down the power supply to the winch, or to hoisting, luffing, slewing, travelling or traversing motors; and
  - (iii) does not affect lighting, indicators, electromagnetic lifting devices, cargo hook or twistlock controls, or other circuits not controlling the motion of the load or the crane.

### **4 Gear transmission**

A winch that has more than 1 transmission ratio must have a positive means of locking each gear shifting device.

### **5 Information on defined limits**

A crane used in loading or unloading must have, in a position conveniently visible to the driver:

- (a) for 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 the range; and

- (ii) if the safe working load varies within the range of the crane — a device or instrument that continuously indicates the outreach; and
- (b) for a crane designed to operate within defined limits of list or trim:
  - (i) instructions, in English, for the operation of the crane within the limits; and
  - (ii) a device or instrument that indicates whether or not the crane is within the limits; and
- (c) for a crane with gearing or other devices for changing the speed range in the hoisting motion — instructions, in English, stating the safe working load for each operating speed range.

## **6 Remote controls**

- (1) A crane, or winches associated with a derrick crane, used in loading or unloading and controlled externally by remote control must have controls that comply with:
  - (a) clause 1; or
  - (b) clause 17 of Schedule 2.
- (2) A remote control that uses radio or acoustic transmission of control orders and equipment state must not be used if the system can be affected by extraneous transmissions.

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## Schedule 7 Marking of cargo mass

(subsection 16(1))

### 1 Gross mass of cargo

- (1) An individual article of cargo, or a unitised article of cargo of at least 1 tonne gross mass, must have marked on it, or on a securely attached label, the gross mass of the article or unit in legible characters at least 25 mm high.

*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.

- (2) If the actual gross mass is not marked on an article of transport equipment, it is taken to be the maximum gross mass or, for a flexible intermediate bulk container, the SWL marked on the item.

### 2 Mass of unitised and pre-slung cargo

For clause 1, if packages or articles of cargo are grouped or pre-slung 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

- (1) For an article of transport equipment that is to be loaded or unloaded, the gross mass is taken to be:
- (a) the maximum operating gross mass or rating of the article; or
  - (b) for a flexible intermediate bulk container — the SWL; or
  - (c) the actual gross mass marked on it; or
  - (d) the amount the shipper tells the master or terminal authorities.
- (2) However, the gross mass is taken to be the tare mass of the article if it does not contain cargo and is declared to be empty by:
- (a) if the article is to be loaded — the shipper; or
  - (b) if the article is to be unloaded — the master.

### 4 Gross mass of mechanical stowing appliances

- (1) A mechanical stowing appliance, or any part of it, that has a gross mass of at least 1 tonne may be hoisted or lowered only if it is prominently marked, or has a label securely attached, with its gross mass in legible characters at least 25 mm high.
- (2) For subclause (1), the gross mass includes the mass of the appliance or part, fully equipped and fuelled.

## Schedule 8 Approved splices in wire rope

(subsection 22(1), paragraph 2(1)(d) of Schedule 4)

### 1 General

- (1) A splice must be well made and tightly drawn.
- (2) The first set of tucks of a splice may be made in any sequence that enables the splice to be properly made and tightly drawn.
- (3) The number of tucks mentioned in this Schedule for a splice is the minimum number for the splice.

### 2 Types of splice

- (1) A hand-spliced eye must comply with section 4.4.3 of the ILO Code.
- (2) Each whole strand end must include, at least, a second, third and fourth tuck of the same type.
- (3) After the first tuck, the splice must:
  - (a) be tapered:
    - (i) with each of 3 sets of tucks using a whole strand end of the rope and made over 1 and under 1 against the lay, cutting out alternate strand ends after the fourth tuck, with the remaining strand ends tucked in the same way as the previous 2 tucks; or
    - (ii) with each of 3 sets of tucks using a whole strand end of the rope and made over 1 and under 2 against the lay, cutting out either alternate strand ends or half the wires after the fourth tuck, with the remaining strand ends or remaining wires tucked in the same way as the previous 3 tucks; or
    - (iii) with each of 3 sets of tucks using a whole strand end of the rope and made over 1 against the lay and under 2 with the lay, cutting out half of the wires from each of the strand ends after the fourth tuck, with the remaining wires in each strand end tucked in the same way as the previous 3 tucks; or
    - (iv) with each of 3 sets of tucks a whole strand end of the rope and made over 1 against the lay and under 2 with the lay, cutting out half of the wires from each of the strand ends after the fourth tuck, with the remaining wires in each strand end tucked over 1 and under 2 against the lay; or
    - (v) with each of 3 sets of tucks using a whole strand end of the rope and made over 2 against the lay and under 2 with the lay, cutting out half of the wires from each of the strand ends after the fourth tuck, with the remaining wires in each strand end tucked in the same way as the previous 3 tucks; or
  - (b) have its ends turned with the second, third and fourth tucks made in accordance with paragraph (a), tucking alternative ends backwards into the rope after the fourth tuck to conceal the ends, with the remaining alternative ends tucked in the same direction and then tucked backwards into the rope to conceal the ends.

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### **3 Swaged splices**

- (1) A looped eye or thimble secured by means of a compressed metal ferrule may be used as a splice if:
  - (a) the ferrule is made of material that can withstand 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.
- (2) The following patented methods of swaged splices may be used:
  - (a) Australoc;
  - (b) Marsplice;
  - (c) Superloop;
  - (d) Talurit;
  - (e) US Wire Rope.

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## Notes to Marine Order 32 (Cargo handling equipment) 2016

### Note 1

*Marine Order 32 (Cargo handling equipment) 2016* (in force under subsection 342(1) of the *Navigation Act 2012*) as shown in this compilation comprises *Marine Order 32 (Cargo handling equipment) 2016* amended as indicated in the following tables.

#### Table of Orders

Year and number	Registration date	FRLI number	Commencement date	Application, saving or transitional provisions
<i>Marine Order 32 (Cargo handling equipment) 2016</i> (MO 2016/19)	13 Dec 2016	F2016L01935	1 January 2017	–
<i>Marine Orders (Navigation Act) Administrative Amendment 2017</i> (MO 2017/5)	10 October 2017	F2017L01336	11 October 2017	–

#### Table of amendments

ad. = added or inserted    am. = amended    rep. = repealed    rs. = repealed and substituted

Provision affected	How affected
1A .....	rep. <i>Legislation Act 2003</i> , s. 48D
1B .....	rep. <i>Legislation Act 2003</i> , s. 48C
4.....	am. 2017/5
Schedule 3.....	am. 2017/5