

## 22 BOARDING ARRANGEMENTS

### 22.1 Introduction

**22.1.1** Safe means of access must be provided between the ship and the shore or another ship alongside which the ship is secured. Providing safe access to and from a ship is considered to be an integral part of ensuring a safe working environment on board, as required by the Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations 1997, regulation 5(2)(e). Following the principles and guidance in this chapter will generally be considered to demonstrate compliance with the duty to ensure a safe working environment on board ship. Where different measures are taken to provide a safe means of access, these alternative measures must provide at least an equivalent level of safety in the operating conditions at the time.

*S.I. 1997/2962*

**22.1.2** This chapter sets out general principles that must be complied with, and best practice guidance. It highlights some areas that may require attention in respect of boarding arrangements.

### 22.2 General principles

**22.2.1** Arrangements for boarding should be provided that are fit for purpose, comply with the appropriate standards in this chapter and are properly maintained in accordance with section 22.7.

**22.2.2** Gangways and accommodation ladders are to be considered as lifting equipment and should be tested and recorded as such.

**22.2.3** Where the provision of equipment is necessary to ensure safe means of access, it must be placed in position promptly, be properly rigged and deployed, safe to use and adjusted as necessary to maintain safe access. Rigging equipment should not form a trip hazard. Ships should comply with inspection, testing and maintenance requirements.

*IMO MSC.1/Circ. 1331*

**22.2.4** The means of access should be inspected to ensure that it is safe to use after rigging. There should be further checks to ensure that adjustments are made when necessary due to

tidal movements or change of trim and freeboard. Guard ropes, chains, etc. should be kept taut at all times and stanchions should be rigidly secured.

22.2.5 When access equipment is provided from the shore, it is still the responsibility of the master to ensure as far as is reasonably practicable that the equipment meets these requirements.

22.2.6 Any access equipment and immediate approaches to it must be adequately lit. For appropriate standards of lighting, see Chapter 11, Safe movement on board ship, Annex 11.2.

22.2.7 The means of boarding and its immediate approaches should be kept free from obstruction and, as far as is reasonably practicable, kept clear of any substance likely to cause a person to slip or fall. Where this is not possible, appropriate warning notices should be posted and if necessary the surfaces suitably treated.

22.2.8 Each end of a gangway or accommodation or other ladder should provide safe access to a safe place or to an auxiliary safe access.

22.2.9 A portable ladder should only be used for access to a ship when no safer access is reasonably practicable. A rope ladder should only be used between a ship with a high freeboard and a ship with a low freeboard or between a ship and a boat if no safer means of access is reasonable practicable.

22.2.10 A lifebuoy with a self-activating light and also a separate buoyant safety line attached to a quoit or some similar device must be provided ready for use at the point of access aboard the ship.

## 22.3 Safety nets

22.3.1 An adequate number of safety nets of a suitable size and strength are to be carried on the ship or otherwise be readily available. Where there is a risk of a person falling from the access equipment or from the quayside or ship's deck adjacent to the access equipment, a safety net must be mounted where reasonably practicable.

22.3.2 The aim of safety nets is to minimise the risk of injury arising from falling between the ship and the quay or falling onto the quay, deck or between two vessels. As far as is reasonably practicable, the whole length of the means of access should be covered. Safety nets should be securely rigged, with use being made of attachment points on the quayside where appropriate.

## 22.4 Use of equipment

22.4.1 When suitable access equipment is provided from the ship or from the shore or from another ship, any person boarding or leaving the ship shall use that equipment.

*S.I. 1997/2962*

## 22.5 Positioning of boarding equipment

22.5.1 The angles of inclination of a gangway or accommodation ladder should be kept within the limits for which it was designed.

22.5.2 When the inboard end of the gangway rests on or is flush with the top of the bulwark, a bulwark ladder should be provided. Any gap between the bulwark ladder and the gangway should be adequately fenced to a height of at least 1 metre.

22.5.3 Gangways and other access equipment should not be rigged on ships' rails unless the rail has been reinforced for that purpose. They should comply with the guidance in Annex 22.1.

22.5.4 The means of access should be sited clear of the cargo working area and so placed that no suspended load passes over it. Where this is not practicable, access should be supervised at all times.

22.5.5 When an accommodation ladder is being rigged, this should be completed with the ladder in the horizontal position so that those working on it can be safely attached with a safety line to the deck and the ladder secured to reduce any unnecessary movement.

22.5.6 During the rigging process the seafarer must maintain awareness of their safety, fence any gaps in the railing as per Annex 22.1 Section 2.3 and follow guidance for working at height.

[Insert ref; Chapter 17](#)

## 22.6 Portable and rope ladders

22.6.1 Where, exceptionally, a portable ladder is used for the purpose of access to the ship, it is very important that the ladder is checked regularly by a competent person, and that account is taken of vessel movement and tide changes.

22.6.2 When it is necessary to use a portable ladder for access, it should be used at an angle of 75° from the horizontal. The ladder should extend at least 1 metre above the upper landing place unless there are other suitable handholds. It should be properly secured against slipping, shifting sideways or falling and be so placed as to afford a clearance of at least 150 mm behind the rungs.

22.6.3 When a portable ladder is resting against a bulwark or rails, there should be suitable safe access to the deck.

22.6.4 A rope ladder should be secured to a proper fixing point, and never to rails or to any other means of support unless they are constructed for the purpose.

22.6.5 A rope ladder should be left in such a way that it either hangs fully extended from a securing point or is pulled up completely. It should not be left so that any slack will suddenly pay out when the ladder is used.

22.6.6 Where the freeboard is 9 metres or more, a rope ladder should only be used in conjunction with an accommodation ladder, leading aft and positioned in such a way as to provide safe and easy access from the rope ladder to the bottom platform.

## 22.7 Maintenance of equipment for means of access

22.7.1 Any equipment used for boarding or for hoisting boarding equipment, including lifting wires, should be inspected by a competent person at appropriate intervals, properly maintained and parts renewed in accordance with the manufacturer's instructions.

Additional checks should be made each time the equipment is rigged, looking out for signs of

distortion, cracks or corrosion. Welding connections should be given particular attention in inspections.

*SOLAS II.1/3-9 and MSC.1/Circ.1331*

**22.7.2** Arrangements should be made to inspect the underside of gangways and ladders periodically. Any defects affecting the safety of any access equipment, including access provided by a shore authority, should be reported immediately to a responsible person and made good before further use.

**22.7.3** Aluminium equipment should be examined for corrosion and fracture in accordance with the instructions in Annex 22.2.

**22.7.4** All inspections, maintenance work and repairs should be recorded. The record should include the date of the most recent inspection, the name of the person or body carrying out the inspection, the due date for inspection and the dates for renewal of wires for supporting the equipment.

**22.7.5** Gangways, accommodation ladders and winches used for lifting or access should be tested in the same way as all other lifting appliances and records maintained, including any test certificates.

## **22.8** Special circumstances

**22.8.1** In some circumstances, it may not be practical to mount proper safe boarding arrangements by conventional means, e.g. where there is frequent movement of the ship during cargo operations, or where access is required between the ship and an offshore structure. On such occasions, boarding should be carefully supervised and consideration given to providing alternative means of access.

**22.8.2** Further guidance on safe access to offshore structures is in Chapter 31, Ships serving offshore oil and gas installations.

**22.8.3** Small boats or tenders used between the shore and the ship should be safe and stable for the expected conditions, suitably powered, correctly operated, properly equipped with the necessary safety equipment and, if not a ship's boat, approved for that purpose.

22.8.4 Where a vessel is moored alongside another vessel, there should be cooperation between the two vessels in order to provide suitable and safe boarding arrangements. Access should generally be provided by the ship lying outboard, except that, where there is a great disparity in freeboard, access should be provided by the ship with the higher freeboard.

22.8.5 Care should be taken at all times, but particularly at night, when boarding or leaving a ship, or when moving through the dock area. The edges of the docks, quays, etc. should be avoided and any sign prohibiting entry to an area should be strictly observed. Where there are designated routes they should be followed exactly. This is particularly important in the vicinity of container terminals or other areas where rail traffic, straddle carriers or other mechanical handling equipment is operating, because the operators of such equipment have restricted visibility, placing anyone walking within the working area at risk.

22.8.6 Transfer of personnel between two unsecured ships at sea is potentially a particularly dangerous manoeuvre, and should be avoided where possible. Where such a manoeuvre is unavoidable, a risk assessment of the transfer arrangements should be undertaken and appropriate safety measures put in place to ensure the safety of those involved. Both vessels should be properly equipped and/or modified to allow the boarding to be undertaken without unnecessary risk. A proper embarkation point should be provided, and the boarding procedure clearly agreed. The relative movements of both vessels in any seaway and varying sea, tide and swell conditions make the judgement of when to effect a transfer crucial. The master responsible for the transfer operation should have full sight of the area of transfer and, with at least one designated crew member, be able to communicate at all times with the crew member making the transfer. It is recommended that vessels undertaking ship-to-ship transfers while under way should carry equipment designed to aid in the rapid recovery of a casualty from the waters.

*S.I. 2002/1473*

22.8.7 A working lifejacket should be donned when there is a risk of falling into the water when transferring to a vessel or structure that is not alongside. The transfer of baggage or other items should be done by the crews of the vessels and not by those boarding.

## 22.9 Access for pilots

22.9.1 The Company is required to provide pilot ladders and accommodation ladders that comply with the construction and testing requirements laid out in SOLAS Chapter V, regulation 23 as amended. Guidance on these standards is included in Annex 22.1.

*S.I. 2002/1473 and MSN 1734(M+F), IMO Resolution A.1045(27) and BS ISO 799:2004*

22.9.2 In addition, the master must ensure the following:

- All pilot ladders used for pilot transfer should be clearly identified with tags or other permanent marking so as to enable identification of each appliance for the purposes of survey, inspection and record keeping. A record should be kept on the ship as to the date the identified ladder is placed into service and any repairs effected.
- Each pilot ladder, accommodation ladder and their associated equipment are properly maintained and stowed, and regularly inspected to ensure that, so far as is reasonably practicable, each is safe to use.
- Each pilot ladder is used only for the embarkation and disembarkation of pilots and by officials and other persons while a ship is arriving at or leaving a port.
- The rigging of the pilot ladder, accommodation ladder and associated equipment is supervised by a responsible officer who is in communication with the navigating bridge. This officer's duties will include arranging for the pilot to be escorted by a safe route to and from the bridge. Advice on safe rigging of such equipment is included in this chapter (see section 22.10).
- Personnel engaged in rigging or operating any mechanical equipment are instructed in the safe procedures to be adopted and that the equipment is to be tested prior to each use.

22.9.3 A safety line and harness, a lifebuoy with a self-igniting light, and a heaving line should be kept at hand ready for use at the point of boarding.

22.9.4 The pilot ladder, accommodation ladder and the position where the person embarks and disembarks on the ship should be adequately lit.

22.9.5 It is very important that the ship offers a proper lee to the pilot boat. The arrangements for boarding should preferably be sited as near amidships as possible, but in no circumstances should they be in a position that could lead to the pilot boat running the

risk of passing underneath overhanging parts of the ship's hull structure. Further information is contained in marine guidance note MGN 301(M+F).

*MGN 301(M+F)*

## 22.10 Safe rigging of pilot ladders

**22.10.1** In addition to the general points in section 22.2, in order to minimise the danger to pilots when boarding and leaving ships, particular attention should be given to the following points:

- Pilot ladders should be rigged in such a manner that the steps are horizontal, and such that the lower end is at a height above the water to allow ease of access to and from the attendant craft.
- The ladder should rest firmly against the side of the ship.
- When an accommodation ladder is used in conjunction with a pilot ladder, the pilot ladder should extend at least 2 metres above the bottom platform.
- Safe, convenient and unobstructed access should be provided to anyone embarking or disembarking between the ship and the head of the pilot ladder.
- A lifebuoy with self-igniting light should be kept available at the point of access to the ship.
- At night, the pilot ladder and ship's deck should be lit by a forward-shining, overside light.

See the 'Required boarding arrangements for pilot' diagram on the International Maritime Pilots' Association website, which is listed in Appendix 2, Other sources of information, of this Code.

## 22.11 Safe access to small craft

**22.11.1** Ports and harbours may not have areas specifically designed to ensure safe access to and from small vessels. In determining how access will be provided, it is good practice to consider each of the options below, starting with gangways before moving to the next level. The most suitable means of access should be identified by risk assessment, considering which safety measures are required.

**22.11.2** All these methods for gaining access to small craft can be used safely providing appropriate safety measures are taken.



22.11.3 The industry's recommended hierarchy of access arrangements for small craft, starting with the safest first, is as follows:

- Gangway between small craft and the quay, quay steps, quay wall, pier or other vessel/small craft.
- Stepping directly (short step, level access) between the small craft and the quay, quay steps, quay wall, pier, other vessel/small craft or pontoon.
- Fixed ladder from the quay, quay wall, pier or jetty.
- Portable ladder between the small craft and the quay, quay wall, pier or jetty.

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## ANNEX 22.1 STANDARDS FOR MEANS OF ACCESS

*ISO 5488:1979, ISO 7061:1993, MSC.1/Circ.1331*

### 1. General

1.1 Accommodation ladders and gangways should comply with appropriate international standards such as ISO 5488:1979 Shipbuilding – accommodation ladders and ISO 7061:1993 Shipbuilding – aluminium shore gangways for seagoing vessels.

*BS MA 89:1980*

1.2 The structure of accommodation ladders and gangways and their fittings should allow regular inspection and maintenance of all parts and, where necessary, lubrication of their pivot pin. Each accommodation ladder or gangway should be clearly marked at each end with a plate showing any restrictions on safe operation or loading including minimum and maximum permitted design angles or inclination, design load and maximum load on the bottom end plate. Where the maximum operating load is less than the design load, that should also be shown on the marking plate.

1.3 Gangways should be carried on ships of 30 metres in length or over and accommodation ladders must be carried on ships of 120 metres in length or over, complying with the specifications in section 2. Access equipment must be of good construction, sound material and adequate strength, free from patent defect and properly maintained. Rope ladders must comply with the requirements in section 4.

1.4 Gangways and accommodation ladders must be clearly marked with the manufacturer's name, the model number, the maximum designed angle of use and the maximum safe loading, both by numbers of persons and by total weight.

### 2. Gangways

2.1 Gangways must comply with the specifications set out in standard BS MA 78:1978 or equivalent, and should be fitted with suitable fencing along their entire length.

*BS MA 78:1978*

2.2 They should not be used at an angle of more than 30° from the horizontal, unless designed and constructed for use at greater angles.

2.3 Gangways should not be fixed to the ship's railings unless designed for such use. If rigged in an open section in the ship's bulwark or railings, any remaining gaps should be adequately fenced.

### 3. Accommodation ladders

3.1 An accommodation ladder should be designed so that:

- it rests firmly against the side of the ship where practicable;
- the angle of slope is no more than 55°. Treads and steps should provide a safe foothold at the angle at which the ladder is used;
- it is fitted with suitable fencing (preferably rigid handrails) along its entire length, except that fencing at the bottom platform may allow access from the outboard side;

*BA MA 39, Part 2: 1973*

- at a maximum inclination, the lowest platform of the ladder is no more than 600 mm above the waterline in the lightest seagoing conditions;

*SOLAS III/3.13*

- the bottom platform is horizontal, and any intermediate platforms are self-levelling;
- it provides direct access between the head of the ladder and the ship's deck by a platform securely guarded with guardrails and adequate handholds;
- it can easily be inspected and maintained; and
- it is rigged as close to the working area but clear of any cargo operations as possible.

3.2 After installation, the winch and ladder should be operationally tested to confirm proper operation and condition of the winch and ladder after the test. This test should include raising and lowering the accommodation ladder at least twice (e.g. ISO 7364:1983). Records should be maintained, including any test certificates.

*ISO 7364:1983*

3.3 When a bulwark ladder is to be used, it must comply with the specifications set out in the Shipbuilding Industry Standard No. SIS 7 or BS MA 39, Part 2:1973 Specification for ships' ladders, or be of an equivalent standard. Adequate fittings must be provided to enable the bulwark ladder to be properly and safely secured.

## 4. Pilot ladders

*SOLAS Chapter V.23, S.I. 2002/1473, MSN 1734(M+F) and BS ISO 799:2004*

4.1 A rope ladder must be of adequate width and length and so constructed that it can be efficiently secured to the ship.

- The steps must provide a slip-resistant foothold of not less than 400 mm × 115 mm × 25 mm and must be so secured that they are firmly held against twist, turnover or tilt.
- The steps must be horizontal and equally spaced at intervals of 310 mm (± 5mm).
- The side ropes, which should be a minimum of 18 mm in diameter, should be equally spaced.
- There should be no shackles, knots or splices between rungs.
- Ladders of more than 1.5 metres in length must be fitted with spreaders not less than 1.8 metres long. The lowest spreader must be on the fifth step from the bottom and the interval between spreaders must not exceed nine steps. The spreaders should not be lashed between steps.

4.2 New or replacement pilot ladders fitted on or after 1 July 2012 should be certified by the manufacturer as being compliant with international standards and duly marked as being Marine Equipment Directive (MED) approved (EC Directive 96/98/EC of 20 December 1996 on marine equipment as amended). Merchant shipping notice MSN 1734(M+F) as amended provides more information. A pilot ladder (conforming to BS ISO 799:2004) can be accepted provided that it meets the regulation requirements.

4.3 In addition to the standards above, every pilot ladder should be positioned and secured so that:

- it is clear of any possible discharges from the ship;
- it is, where practicable, within the mid-ship half-section of the ship (but see section 22.9.5);
- it can rest firmly against the ship's side; and
- the person climbing it can safely and conveniently board the ship after climbing no more than 9 metres.

4.4 Where replacement steps are fitted, they should be secured in position by the method used in the original construction of the ladder. No pilot ladder should have more than two replacement steps secured in position by a different method. Where a

replacement step is secured by means of grooves in the sides of the step, such grooves should be in the longer sides of the step.

4.5 Two man-ropes of not less than 28 mm in diameter, properly secured to the ship, should be provided.

4.6 Where access to the ship is by a gateway in the rails or bulkhead, adequate handholds should be provided. Shipside doors used for this purpose should not open outwards.

4.7 Where access is by bulwark ladder, the ladder should be securely attached to the bulwark rail or landing platform. Two handhold stanchions should be provided, between 700 mm and 800 mm apart, each of which should be rigidly secured to the ship's structure at or near its base and at another higher point. The stanchions should be at least 40 mm in diameter and extend no less than 1.20 metres above the top of the bulwarks.

4.8 Where the freeboard of the ship is more than 9 metres, accommodation ladders must be provided on each side of the ship.

4.9 Such accommodation ladders should comply with the standards in paragraph 2.1 of this annex, and in addition:

- the pilot ladder should extend at least 2 metres above the accommodation ladder's bottom platform; and
- if a trap door is fitted in the bottom platform to allow access to the pilot ladder, the opening should be no less than 750 mm square, and the after part of the bottom platform should be fenced as the rest of the ladder. In this case, the pilot ladder should extend above the lower platform to the height of the handrail.

## ANNEX 22.2 CORROSION AND FRACTURES OF ACCOMMODATION LADDERS AND GANGWAYS

- Aluminium alloys are highly susceptible to galvanic corrosion in a marine atmosphere if they are used in association with dissimilar metals. Great care should be exercised when connecting mild steel fittings, whether or not they are galvanised, to accommodation ladders and gangways constructed of aluminium.
- Plugs and joints of neoprene, or other suitable material, should be used between mild steel fittings, washers, etc. and aluminium. The plugs or joints should be significantly larger than the fittings or washers.
- Repairs using mild steel doublers or bolts made of mild steel or brass or other unsuitable material should be considered temporary. Permanent repairs, or the replacement of the means of access, should be undertaken at the earliest opportunity.
- The manufacturer's instructions should give guidance on examination and testing of the equipment. However, close examination of certain parts of accommodation ladders and gangways is difficult because of their fittings and attachments.
- Aluminium welds are susceptible to fracture. Where fractures are found, these should be made good at the earliest opportunity.

It is essential, therefore, that the fittings are removed periodically for a thorough examination of the parts most likely to be affected by corrosion. Accommodation ladders and gangways should be turned over to allow for a thorough examination of the underside.

Particular attention should be paid to the immediate perimeter of the fittings; this area should be tested for corrosion with a wire probe or scribe. Where the corrosion appears to have reduced the thickness of the parent metal to 3 mm, back plates should be fitted inside the stringers of the accommodation ladder or gangways.