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CHANGES IN THE RULES

General
The present edition of the rules includes additions and amendments decided by the Board as of December 2001, and supersedes the January 2001 edition of the same chapter, including later amendments.
The rule changes come into force 1 July 2002.
This chapter is valid until superseded by a revised chapter. Supplements will not be issued except for an updated list of corrections presented in Pt.0 Ch.1 Sec.3. Pt.0 Ch.1 is normally revised in January and July each year.
Revised chapters will be forwarded to all subscribers to the rules. Buyers of reprints are advised to check the updated list of rule chapters printed in Pt.0 Ch.1 Sec.1 to ensure that the chapter is current.

Main changes
This booklet has been updated in accordance with IMO MSC 73rd session in adopting SOLAS Chapter V.

Corrections and Clarifications
In addition to the above stated rule amendments, a number of detected errors, corrections and clarifications have been made to the existing rule text.

Comments to the rules may be sent by e-mail to rules@dnv.com
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If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million.
In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.
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SECTION 1
GENERAL REQUIREMENTS

A. Classification

A 100 General
101 The requirements in this chapter are in compliance with the International Convention for the Safety of Life at Sea (SOLAS), Chapter V (Safety of Navigation) with the latest amendments in force from 1 July 2002.

102 SOLAS Chapter V amendments of a later date than 1 July 2002 will be applicable if entered into force before the date of the ship’s written request for classification.

103 SOLAS text is printed in Italics. References to SOLAS regulations are given.

104 For the application of these rules, wherever the term Administration is quoted, this is to be read as the Society.

105 If any part of the rules are subject to discussion or misunderstanding, the SOLAS text shall prevail.

106 Navigational equipment installed, not necessarily required by the rules, that may have an impact on safety of main navigational systems and equipment on the bridge and bridge procedures shall be taken with the aim of:

Guidance note:
Refer to Guidelines on ergonomic criteria for bridge equipment and layout (MSC/Circ.982), Performance standards for IBS (resolution MSC.64(67), annex 1); and for INS (resolution MSC.86(70), annex 3).

---end---of---Guidance---note---

1 facilitating the tasks to be performed by the bridge team and the pilot in making full appraisal of the situation and in navigating the ship safely under all operational conditions;
2 promoting effective and safe bridge resource management;
3 enabling the bridge team and the pilot to have convenient access to essential information which is presented in a clear and unambiguous manner, using standardized symbols and coding systems for controls and displays;
4 indicating the operational status of automated functions and integrated components, systems and/or sub-systems;
5 allowing for expeditious, continuous and effective information processing and decision-making by the bridge team and the pilot;
6 preventing or minimizing excessive or unnecessary work and any conditions or distractions on the bridge which may cause fatigue or interfere with the vigilance of the bridge team and the pilot; and
7 minimizing the risk of human error and detecting such error if it occurs, through monitoring and alarm systems, in time for the bridge team and the pilot to take appropriate action.

(SOLAS reg. V/1)

A 200 Principles relating to bridge design, design and arrangement of navigational systems and equipment and bridge procedures (Regulation 15)

201 All decisions which are made for the purpose of applying the requirements of regulations 19, 22, 24, 25, 27 and 28 and which affect bridge design, the design and arrangement of navigational systems and equipment on the bridge and bridge procedures shall be taken with the aim of:

---end---of---Guidance---note---

1 warships, naval auxiliaries and other ships owned or operated by a Contracting Government and used only on government non-commercial service; and
2 ships solely navigating the Great Lakes of North America and their connecting and tributary waters as far east as the lower exit of the St. Lambert Lock at Montreal in the Province of Quebec, Canada.

However, warships, naval auxiliaries or other ships owned or operated by a Contracting Government and used only on government non-commercial service are encouraged to act in a manner consistent, so far as reasonable and practicable, with this chapter.

2 The Administration may decide to what extent this chapter shall apply to ships operating solely in waters landward of the baselines which are established in accordance with international law.

3 A rigidly connected composite unit of a pushing vessel and associated pushed vessel, when designed as a dedicated and integrated tug and barge combination, shall be regarded as a single ship for the purpose of this chapter.

4 The Administration shall determine to what extent the provisions of regulations 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27 and 28 do not apply to the following categories of ships:

1 ships below 150 gross tonnage engaged on any voyage;
2 ships below 500 gross tonnage not engaged on international voyages; and
3 fishing vessels.

(SOLAS reg. V/1)

A 400 Definitions (Regulation 2)
401 For the purpose of this chapter:
1 "Constructed" in respect of a ship means a stage of construction where:

1 the keel is laid; or
2 construction identifiable with a specific ship begins; or
3 assembly of the ship has commenced comprising at least 50 tonnes or 1% of the estimated mass of all structural material whichever is less.

2 "Nautical chart" or "nautical publication" is a special-purpose map or book, or a specially compiled database from which such a map or book is derived, that is issued officially by or on the authority of a Government, authorized Hydrographic Office or other relevant government institution and is designed to meet the requirements of marine navigation.

Guidance note:
Refer to appropriate resolutions and recommendations of the International Hydrographic Organization concerning the authority and responsibilities of coastal States in the provision of charting in accordance with regulation 9.

---end---of---Guidance---note---

3 "All ship" means any ship, vessel or craft irrespective of type and purpose.

(SOLAS reg. V/2)

A 500 Exemptions and equivalents (Regulation 3)

501 General
1 The Administration may grant general exemptions to ships
without mechanical means of propulsion from the requirements of regulations 15, 17, 18, 19 (except 19.2.1.7), 20, 22, 24, 25, 26, 27 and 28.

2 The Administration may grant to individual ships exemptions or equivalents of a partial or conditional nature, when any such ship is engaged on a voyage where the maximum distance of the ship from the shore, the length and nature of the voyage, the absence of general navigational hazards, and other conditions affecting safety are such as to render the full application of this chapter unreasonable or unnecessary, provided that the Administration has taken into account the effect such exemptions and equivalents may have upon the safety of all other ships.

3 Each Administration shall submit to the Organization, as soon as possible after 1 January in each year, a report summarising all new exemptions and equivalents granted under paragraph 2 of this regulation during the previous calendar year and giving the reasons for granting such exemptions and equivalents. The Organization shall circulate such particulars to other Contracting Governments for information.

(SOLAS reg. V/3)

B. Documentation to be Submitted for Approval

B 100 Bridge design

101 Drawings of the bridge design are to be submitted for approval. Such drawings shall show position of equipment required to be installed by Sec.3, horizontal and vertical fields of vision from the conning position, blind sectors caused by obstructions outside the wheelhouse within the required field of vision, and details such as configuration of bridge wings and height of front bulwark with windscreens.

B 200 Navigational equipment

201 A list of navigational equipment to be installed is to be submitted for approval. Such information shall include identification of manufacturer, type and model of the equipment as well as type approval references or copies of type approval certificates.

202 Where control systems capable of automatically acting on the rudder and or propulsion are installed, documentation is to be submitted as specified in Table A1.

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* One copy is to be submitted for information only
A. Navigation Bridge Visibility

1 Ships of not less than 45 m in length as defined in regulation III/3.12 constructed on or after 1 July 1998, shall meet the following requirements:

.1 The view of the sea surface from the conning position shall not be obscured by more than two ship lengths, or 500 m, whichever is the less, forward of the bow to 10° on either side under all conditions of draught, trim and deck cargo;

Guidance note:

1) For calculation purposes the applied loading condition of the ship should be, a “worst case condition” (with respect to view of the sea surface forward of the bow) recommended for ocean passages. For example for VLCCs the “worst case” condition will be a stern trim ballast condition, while for container carriers a “worst case” condition will occur with a full load of empty containers and trim by the stern.

2) For ships where the rule requirements are exceeded, e.g. for shipping containers on deck or VLCCs in ballast, the bridge deck height is to be increased.

.2 No blind sector caused by cargo, cargo gear or other obstructions outside of the wheelhouse forward of the beam which obstructs the view of the sea surface as seen from the conning position, shall exceed 10°. The total arc of blind sectors shall not exceed 20°. The clear sectors between blind sectors shall be at least 5°. However, in the view described in paragraph .1, each individual blind sector shall not exceed 5°;

.3 The horizontal field of vision from the conning position shall extend over an arc of not less than 225°, that is from right ahead to not less than 22.5°, abaft the beam on either side of the ship;

Guidance note:

Conning position is defined to be in a position with a commanding view fulfilling the requirements as described in .1). .2) .3) and .4). The conning position shall provide the conning officer (pilot) with information as required by Sec.3 A302 2.5.4).

.4 From each bridge wing the horizontal field of vision shall extend over an arc of at least 225°, that is from at least 45° on the opposite bow through right ahead and then from right ahead to right astern through 180° on the same side of the ship.

.5 From the main steering position the horizontal field of vision shall extend over an arc from right ahead to at least 60° on each side of the ship;

Guidance note:

The main steering position is defined to be in a position with a view as required by .5), and equipped as required by Sec.3 A302 2.1.1).

.6 The ship’s side shall be visible from the bridge wing.

Guidance note:

To monitor pilot boats and tugs coming alongside, pilots embarking and the ship’s side as it touches the jetty, the bridge wing should extend to the maximum beam of the ship.

For low freeboard ships (e.g. supply ships), the ship’s side may be visible from the bridge wing; even if the bridge wing does not extend to the maximum beam of the ship.

For other types of ships where the bridge wing does not fully extend to the maximum beam of the ship, alternative solutions making the ship’s side visible from the bridge wing may be accepted.

.7 The height of the lower edge of the navigation bridge front windows above the bridge deck shall be kept as low as possible. In no case shall the lower edge present an obstruction to the forward view as described in this regulation;

Guidance note:

The height of the lower edge of front windows above deck should be kept as low as possible, and should not, as far as is practicable, be more than 1000 mm.

.8 The upper edge of the navigation bridge front windows shall allow a forward view of the horizon, for a person with a height of eye of 1 800 mm above the bridge deck at the conning position, when the ship is pitching in heavy seas. The Administration, if satisfied that a 1 800 mm height of eye is unreasonable and impractical, may allow reduction of the height of eye but not less than 1 600 mm;

Guidance note:

The minimum height of the upper edge of bridge windows should provide a view as required when the ship is pitching 10°. A minimum height of the upper edge of bridge windows of at least 2000 mm above the bridge deck surface will be acceptable unless any special conditions prevail.

.9 Windows shall meet the following requirements:

.9.1 To help avoid reflections, the bridge front windows shall be inclined from the vertical plane top out, at an angle of not less than 10° and not more than 25°.

.9.2 Framing between navigation bridge windows shall be kept to a minimum and not be installed immediately forward of any workstation.

.9.3 Polarised and tinted windows shall not be fitted.

.9.4 A clear view through at least two of the navigation bridge front windows and, depending on the bridge configuration, an additional number of clear-view windows shall be provided at all times, regardless of weather conditions.
2 (Regulation V/22.2) of SOLAS concerns retroactive requirements for bridge design and is given in Pt.7 Ch.1 Sec.6)

3 On ships of unconventional design which, in the opinion of the Administration cannot comply with this regulation, arrangements shall be provided to achieve a level of visibility that is as near as practical to those prescribed in this regulation.

Guidance note:
A ship of a special design, dictated by the special purpose and function of the ship, may be regarded as a "ship of unconventional design". The Society will take into consideration the special nature of the ship, its service and trade when evaluating the effects an exemption may have upon the safe navigation of the ship, the safety of all other ships and the environment.

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(SOLAS reg. V/22).
SECTION 3
BRIDGE EQUIPMENT

A. Technical Requirements

A 100 Electromagnetic Compatibility (Regulation 17)

1 General

Administrations shall ensure that all electrical and electronic equipment on the bridge or in the vicinity of the bridge, on ships constructed on or after 1 July 2002, is tested for electromagnetic compatibility taking into account the recommendations developed by the Organization.*

Guidance note:
* Refer to the General requirements for Electromagnetic Compatibility for all Electrical and Electronic Ship’s Equipment adopted by the Organization by resolution A.813(19).

2 Electrical and electronic equipment shall be so installed that electromagnetic interference does not affect the proper function of navigational systems and equipment.

3 Portable electrical and electronic equipment shall not be operated on the bridge if it may affect the proper function of navigational systems and equipment.

(SOLAS reg. V/17)

Guidance note:
The EMC conditions specified in IEC publication 60945 apply to navigation and communication equipment. The EMC conditions specified in IEC publication 60533 apply to other equipment.

A 200 Approval, surveys and performance standards of navigational systems and equipment and voyage data recorder (Regulation 18)

201 Type approval

1 Systems and equipment required to meet the requirements of regulations 19 and 20 shall be of a type approved by the Administration.

Guidance note:
The term “shall be of a type approved by the Administration” means “shall be type approved by the Administration”.

Guidance note:
For the application of this paragraph, the term Administration is to be read as any recognised classification society, administration or notified body according to the Marine Equipment Directive.

2 Systems and equipment, including associated back-up arrangements, where applicable, installed on or after 1 July 2002 to perform the functional requirements of regulations 19 and 20 shall conform to appropriate performance standards not inferior to those adopted by the Organization.*

Guidance note:
* Refer to the following recommendations adopted by the Organization by the resolutions indicated:
  - Recommendation on Performance Standards for Electronic Chart Display and Information Systems (ECDIS) (resolution A.817(19), as amended by resolutions MSC.64(67), annex 5 and MSC.86(70), annex 4, as appropriate);
  - Recommendation on Performance Standards for shipborne DGPS and DGLOASS maritime radio beacon receiver equipment (resolution MSC.64(67), annex 2) as amended by resolution MSC.114(73);
  - Recommendation on Performance Standards for shipborne DGPS and DGLOASS maritime radio beacon receiver equipment (resolution MSC.53(66)) as amended by resolution MSC.113(73);
  - Recommendation on Performance Standards for combined GPS/GLONASS receiver equipment (resolution MSC.74(69), annex 1) as amended by resolution MSC.115(73);
  - Recommendation on Performance Standards for heading control systems (resolution MSC.64(67), annex 3);
  - Recommendation on Performance Standards for track control systems (resolution MSC.74(69), annex 2);
  - Recommendation on Performance Standards for a universal shipborne automatic identification system (AIS) (resolution MSC.74(69), annex 3);
  - Recommendation on Performance Standards for echo-sounding equipment (resolution A.224(VII), as amended by resolution MSC.74(69), annex 4);
  - Recommendation on Performance Standards for devices to indicate speed and distance (resolution A.824(19)), as amended by resolution MSC.90(72);
  - Performance Standards for rate-of-turn indicators (resolution A.526(13));
  - Recommendation on unification of Performance Standards for navigational equipment (resolution A.575(14));
  - Recommendation on methods of measuring noise levels at listening posts (resolution A.343(IX));
  - Recommendation on Performance Standards for radar reflectors (resolution A.384(X));
  - Recommendation on Performance Standards for magnetic compasses (resolution A.382(X));
  - Recommendation on Performance Standards for daylight signalling lamps (resolution MSC.95(72));
  - Recommendation on Performance Standards for sound reception systems (resolution MSC.86(70), annex 1);
  - Recommendation on Performance Standards for marine transmitting magnetic heading devices (TMHDs) (resolution MSC.86(70), annex 2);
  - Recommendation on Performance Standards for voyage data recorders (VDRs) (resolution A.861(20));
  - Recommendations on Performance Standards for marine transmitting heading devices (THDs) (resolution MSC.116(73)).

Regarding unification of ARPA signals, see MSC/Circ.563 and IEC publication 60872.

3 When systems and equipment are replaced or added to on ships constructed before 1 July 2002, such systems and equipment shall, in so far as is reasonable and practicable, comply with the requirements of paragraph 2.

4 Systems and equipment installed prior to the adoption of performance standards by the Organization may subsequently be exempted from full compliance with such standards at the discretion of the Administration, having due regard to the recommendations and criteria adopted by the Organization. However, for an electronic chart display and information system (ECDIS) to be accepted as satisfying the chart carriage requirement of SOLAS regulation 19.2.1.4, that system shall conform to the rele-

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vant performance standards not inferior to those adopted by the Organization in effect on the date of installation, or, for systems installed before 1 January 1999, not inferior to the performance standards adopted by the Organization on 23 November 1995.

* Recommendation on Performance Standards for Electronic Chart Display and Information Systems (ECDIS) (resolution A.817(19)).

5 The Administration shall require that the manufacturers have a quality control system audited by a competent authority to ensure continuous compliance with the type approval conditions. Alternatively, the Administration may use final product verification procedures where the compliance with the type approval certificate is verified by a competent authority before the product is installed on board ships.

(SOLAS reg. V/18.1 to V/18.5)

202 Additional equipment

6 Before giving approval to systems or equipment embodying new features not covered by this chapter, the Administration shall ensure that such features support functions at least as effective as those required by this chapter.

7 When equipment, for which performance standards have been developed by the Organization, is carried on ships in addition to those items of equipment required by regulations 19 and 20, such equipment shall be subject to approval and shall as far as practicable comply with performance standards not inferior to those adopted by the Organization.

8 The voyage data recorder system, including all sensors, shall be subjected to an annual performance test. The test shall be conducted by an approved testing or servicing facility to verify the accuracy, duration and recoverability of the recorded data. In addition, tests and inspections shall be conducted to determine the serviceability of all protective enclosures and devices fitted to aid location. A copy of the certificate of compliance issued by the testing facility, stating the date of compliance and the applicable performance standards, shall be retained on board the ship.

(SOLAS reg. V/18)

A 300 Carriage requirements for shipborne navigational systems and equipment (Regulation 19)

301 Application and requirements

Subject to the provisions of regulation 1.4:

1.1 Ships constructed on or after 1 July 2002 shall be fitted with navigational systems and equipment which will fulfil the requirements prescribed in paragraphs 2.1 to 2.9.

1.2 Ships constructed before 1 July 2002 shall:

.1 subject to the provisions of paragraphs 1.2.2 and 1.2.3, unless they comply fully with this regulation, continue to be fitted with equipment which fulfils the requirements prescribed in regulations V/11, V/12 and V/20 of the International Convention for the Safety of Life at Sea, 1974 in force prior to 1 July 2002;

.2 be fitted with the equipment or systems required in paragraph 2.1.6 not later than the first survey after 1 July 2002 at which time the radio direction-finding apparatus referred to in V/12 (p) of the International Convention for the Safety of Life at Sea, 1974 in force prior to 1 July 2002 shall no longer be required; and

.3 be fitted with the system required in paragraph 2.4 not later than the dates specified in paragraphs 2.4.2 and 2.4.3.

302 Shipborne navigational equipment and systems

The expression “All ships irrespective of size” does not prevail over Sec.1 A300.

2.1 All ships irrespective of size shall have:

.1 a properly adjusted standard magnetic compass, or other means, independent of any power supply to determine the ship’s heading and display the reading at the main steering position;

.2 a pelorus or compass bearing device, or other means, independent of any power supply to take bearings over an arc of the horizon of 360°;

.3 means of correcting heading and bearings to true at all times;

.4 nautical charts and nautical publications to plan and display the ship’s route for the intended voyage and to plot and monitor positions throughout the voyage; an electronic chart display and information system (ECDIS) may be accepted as meeting the chart carriage requirements of this subparagraph;

Guidance note:

Authorisation may have to be obtained by the flag state and possibly by harbour states when ECDIS is intended to meet the chart carriage requirement in SOLAS.

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.5 back-up arrangements to meet the functional requirements of subparagraph .4, if this function is partly or fully fulfilled by electronic means;*

Guidance note:

* An appropriate folio of paper nautical charts may be used as a back-up arrangement for ECDIS. Other back-up arrangements for ECDIS are acceptable (see appendix 6 to resolution A.817(19), as amended).

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.6 a receiver for a global navigation satellite system or a terrestrial radionavigation system, or other means, suitable for use at all times throughout the intended voyage to establish and update the ship’s position by automatic means;

.7 if less than 150 gross tonnage and if practicable, a radar reflector, or other means, to enable detection by ships navigating by radar at both 9 and 3 GHz;

.8 when the ship’s bridge is totally enclosed and unless the Administration determines otherwise, a sound reception system, or other means, to enable the officer in charge of the navigational watch to hear sound signals and determine their direction;

.9 a telephone, or other means, to communicate heading information to the emergency steering position, if provided.

2.2 All ships of 150 gross tonnage and upwards and passenger ships irrespective of size shall, in addition to the requirements of paragraph 2.1, be fitted with:

.1 a spare magnetic compass interchangeable with the magnetic compass, as referred to in paragraph 2.1.1, or other means to perform the function referred to in paragraph 2.1.1 by means of replacement or duplicate equipment;

.2 a daylight signalling lamp, or other means to communicate by light during day and night using an energy source of electrical power not solely dependent upon the ship’s power supply.

2.3 All ships of 300 gross tonnage and upwards and passenger ships irrespective of size shall, in addition to meeting the re-
requirements of paragraph 2.2, be fitted with:

.1 an echo sounding device, or other electronic means, to measure and display the available depth of water;
.2 a 9 GHz radar, or other means to determine and display the range and bearing of radar transponders and of other surface craft, obstructions, buoys, shorelines and navigational marks to assist in navigation and in collision avoidance;
.3 an electronic plotting aid, or other means, to plot electronically the range and bearing of targets to determine collision risk;
.4 speed and distance measuring device, or other means, to indicate speed and distance through the water;
.5 a properly adjusted transmitting heading device, or other means to transmit heading information for input to the equipment referred to in paragraphs 2.3.2, 2.3.3 and 2.4.

2.4 All ships of 300 gross tonnage and upwards engaged on international voyages and cargo ships of 500 gross tonnage and upwards not engaged on international voyages and passenger ships irrespective of size shall be fitted with an automatic identification system (AIS), as follows:

.1 ships constructed on or after 1 July 2002;
.2 ships engaged on international voyages construct ed before 1 July 2002;
.3 in the case of passenger ships, not later than 1 July 2003;
.4 in the case of tankers, not later than the first survey for safety equipment on or after 1 July 2003;

Guidance note:
Refer to regulation I/8.

.2.3 in the case of ships, other than passenger ships and tankers, of 50,000 gross tonnage and upwards, not later than 1 July 2004;
.2.4 in the case of ships, other than passenger ships and tankers, of 10,000 gross tonnage and upwards but less than 50,000 gross tonnage, not later than 1 July 2005;
.2.5 in the case of ships, other than passenger ships and tankers, of 3,000 gross tonnage and upwards but less than 10,000 gross tonnage, not later than 1 July 2006;
.2.6 in the case of ships, other than passenger ships and tankers, of 500 gross tonnage and upwards but less than 3,000 gross tonnage, not later than 1 July 2007; and
.3 ships not engaged on international voyages constructed before 1 July 2002, not later than 1 July 2008.

.4 The Administration may exempt ships from the application of the requirements of this paragraph when such ships will be taken permanently out of service within two years after the implementation date specified in subparagraphs .2 and .3.

.5 AIS shall:

.1 provide automatically to appropriately equipped shore stations, other ships and aircraft information, including the ship's identity, type, position, course, speed, navigational status and other safety-related information;
.2 receive automatically such information from similarly fitted ships;
.3 monitor and track ships; and
.4 exchange data with shore-based facilities.

.6 the requirements of paragraph 2.4.5 shall not be applied to cases where international agreements, rules or standards provide for the protection of navigational information; and
.7 AIS shall be operated taking into account the guidelines adopted by the Organization.

Guidance note:
Refer to Guidelines on the operation of AIS on ships to be developed by the Organisation.

2.5 All ships of 500 gross tonnage and upwards shall, in addition to meeting the requirements of paragraph 2.3 with the exception of paragraphs 2.3.3 and 2.3.5, and the requirements of paragraph 2.4, have:

.1 a gyro compass, or other means, to determine and display their heading by shipborne non-magnetic means and to transmit heading information for input to the equipment referred in paragraphs 2.3.2, 2.4 and 2.5.5;
.2 a gyro compass heading repeater, or other means, to supply heading information visually to the emergency steering position if provided;
.3 a gyro compass bearing repeater, or other means, to take bearings, over an arc of the horizon of 360º, using the gyro compass or other means referred to in subparagraph .1. However, in the case of ships less than 1,600 gross tonnage, the gyro compass shall be fitted with such means as far as possible;
.4 rudder, propeller, thrust, pitch and operational mode indicators, or other means to determine and display rudder angle, propeller revolutions, the force and direction of thrust and, if applicable, the force and direction of lateral thrust and the pitch and operational mode, all to be readable from the conning position; and
.5 an automatic tracking aid, or other means, to plot automatically the range and bearing of other targets to determine collision risk.

2.6 On all ships of 500 gross tonnage and upwards, failure of one piece of equipment should not reduce the ship's ability to meet the requirements of paragraphs 2.1.1, 2.1.2 and 2.1.4.

2.7 All ships of 3000 gross tonnage and upwards shall, in addition to meeting the requirements of paragraph 2.5, have:

.1 a 3 GHz radar or where considered appropriate by the Administration a second 9 GHz radar, or other means to determine and display the range and bearing of other surface craft, obstructions, buoys, shorelines and navigational marks to assist in navigation and in collision avoidance, which are functionally independent of those referred to in paragraph 2.3.2; and
.2 a second automatic tracking aid, or other means to plot automatically the range and bearing of other targets to determine collision risk which are functionally independent of those referred to in paragraph 2.5.5.

2.8 All ships of 10,000 gross tonnage and upwards shall, in addition to meeting the requirements of paragraph 2.7 with the exception of paragraph 2.7.2, have:

.1 an automatic radar plotting aid, or other means, to plot automatically the range and bearing of at least 20 other targets, connected to a device to indicate speed and distance through the water, to determine collision risks and simulate a trial manoeuvre; and
.2 a heading or track control system, or other means, to automatically control and keep to a heading and/or straight track.
2.9 All ships of 50,000 gross tonnage and upwards shall, in addition to meeting the requirements of paragraph 2.8, have:

.1 a rate of turn indicator, or other means, to determine and display the rate of turn; and
.2 a speed and distance measuring device, or other means, to indicate speed and distance over the ground in the forward and athwartships direction.

3 When "other means" are permitted under this regulation, such means must be approved by Administration in accordance with regulation 18.

4 The navigational equipment and systems referred to in this regulation shall be so installed, tested and maintained as to minimize malfunction.

5 Navigational equipment and systems offering alternative modes of operation shall indicate the actual mode of use.

6 Integrated bridge systems* shall be so arranged that failure of one sub-system is brought to immediate attention of the officer in charge of the navigational watch by audible and visual alarms, and does not cause failure to any other sub-system. In case of failure in one part of an integrated navigational system,** it shall be possible to operate each other individual item of equipment or part of the system separately.

(SOLAS reg. V/19)

** Guidance note:
* Refer to resolution MSC.64(67), annex 1 - Performance standard for Integrated bridge systems.
** Refer to resolution MSC.86(70), annex 3 - Performance standard for Integrated navigational systems.

A 400 Voyage Data Recorders (VDR) (Regulation 20)

1 To assist in casualty investigations, ships, when engaged on international voyages, subject to the provisions of regulation 1.4, shall be fitted with a voyage data recorder (VDR) as follows:

.1 passenger ships constructed on or after 1 July 2002;
.2 ro-ro passenger ships constructed before 1 July 2002 not later than the first survey on or after 1 July 2002;
.3 passenger ships other than ro-ro passenger ships constructed before 1 July 2002 not later than 1 January 2004; and
.4 ships, other than passenger ships, of 3,000 gross tonnage and upwards constructed on or after 1 July 2002.

2 Administrations may exempt ships, other than ro-ro passenger ships, constructed before 1 July 2002 from being fitted with a VDR where it can be demonstrated that interfacing a VDR with the existing equipment on the ship is unreasonable and impracticable.

(SOLAS reg. V/20)

A 500 Other navigational aids

501 All ships are to be equipped with navigation lights, shapes and means of making sound signals complying with the International Regulations for Preventing Collisions at Sea 1972, with later amendments (COLREG).
SECTION 4
PUBLICATIONS AND RECORDS

A. General

A 100 International code of signals (Regulation 21)

A 101 All ships which, in accordance with the present Convention, are required to carry a radio installation shall carry the International Code of Signals as may be amended by the Organization. The Code shall also be carried by any other ship which, in the opinion of the Administration, has a need to use it.

(SOLAS reg. V/21)

A 200 Nautical charts and nautical publications (Regulation 27)

A 201 Nautical charts and nautical publications, such as sailing directions, lists of lights, notices to mariners, tide tables and all other nautical publications necessary for the intended voyage, shall be adequate and up to date.

(SOLAS reg. V/27)

A 300 Records of navigational activities (Regulation 28)

A 301 All ships engaged on international voyages shall keep on board a record of navigational activities and incidents which are of importance to safety of navigation and which must contain sufficient detail to restore a complete record of the voyage, taking into account the recommendations adopted by the Organization.* When such information is not maintained in the ship's log-book, it shall be maintained in another form approved by the Administration.

(SOLAS reg. V/28)

Guidance note:
* Refer to the Guidelines for recording events related to navigation to be developed by the Organization.

A 400 Life-saving signals to be used by ships, aircraft or persons in distress (Regulation 29)

A 401 An illustrated table describing the life-saving signals** shall be readily available to the officer of the watch of every ship to which this chapter applies. The signals shall be used by ships or persons in distress when communicating with life-saving stations, maritime rescue units and aircraft engaged in search and rescue operations.

(SOLAS reg. V/29)

Guidance note:
** Such life-saving signals are described in the International Aeronautical and Maritime Search and Rescue Manual (IAMSAR) Vol. III, Mobile Facilities and illustrated in the International Code of Signals, as amended pursuant to resolution A.80(IV).

A 500 Operational limitations (Regulation 30)

A 501 General

1. This regulation applies to all passenger ships to which chapter I applies.

2. A list of all limitations on the operation of a passenger ship including exemptions from any of these regulations, restrictions in operating areas, weather restrictions, sea state restrictions, restrictions in permissible loads, trim, speed and any other limitations, whether imposed by the Administration or established during the design or the building stages, shall be compiled before the passenger ship is put in service. The list, together with any necessary explanations, shall be documented in a form acceptable to the Administration, which shall be kept on board readily available to the master. The list shall be kept updated. If the language used is not English or French, the list shall be provided in one of the two languages.

(SOLAS reg. V/30)
SECTION 5
PILOT TRANSFER ARRANGEMENTS (REGULATION 23)

A. General

1.1 Ships engaged on voyages in the course of which pilots are likely to be employed shall be provided with pilot transfer arrangements.

1.2 Equipment and arrangements for pilot transfer which are installed on or after 1 January 1994 shall comply with the requirements of this regulation, and due regard shall be paid to the standards adopted by the Organization.*

Guidance note:
* Refer to the Recommendation on pilot transfer arrangements, adopted by the Organization by resolution A.889(21), MSC/Circ.568/Rev.1 Required Boarding Arrangement for Pilots.

1.3 Equipment and arrangements for pilot transfer which are provided on ships before 1 January 1994 shall at least comply with the requirements of regulation 17 of the International Convention for the Safety of Life at Sea, 1974 in force prior to that date, and due regard shall be paid to the standards adopted by the Organization prior to that date.

1.4 Equipment and arrangements that are replaced after 1 January 1994 shall, in so far as is reasonable and practicable, comply with the requirements of this regulation.

2 General

2.1 All arrangements used for pilot transfer shall efficiently fulfil their purpose of enabling pilots to embark and disembark safely. The appliances shall be kept clean, properly maintained and stowed and shall be regularly inspected to ensure that they are safe to use. They shall be used solely for the embarkation and disembarkation of personnel.

2.2 The rigging of the pilot transfer arrangements and the embarkation of a pilot shall be supervised by a responsible officer having means of communication with the navigation bridge who shall also arrange for the escort of the pilot by a safe route to and from the navigation bridge. Personnel engaged in rigging and operating any mechanical equipment shall be instructed in the safe procedures to be adopted and the equipment shall be tested prior to use.

3 Transfer arrangements

3.1 Arrangements shall be provided to enable the pilot to embark and disembark safely on either side of the ship.

3.2 In all ships where the distance from sea level to the point of access to, or egress from, the ship exceeds 9 m, and when it is intended to embark and disembark pilots by means of the accommodation ladder, or by means of mechanical pilot hoists or other equally safe and convenient means in conjunction with a pilot ladder, the ship shall carry such equipment on each side, unless the equipment is capable of being transferred for use on either side.

3.3 Safe and convenient access to, and egress from, the ship shall be provided by either:

.1 a pilot ladder requiring a climb of not less than 1.5 m and not more than 9 m above the surface of the water so positioned and secured that:

.1.1 it is clear of any possible discharges from the ship;
.1.2 it is within the parallel body length of the ship and, as far as is practicable, within the mid-ship half length of the ship;
.1.3 each step rests firmly against the ship’s side; where constructive features, such as rubbing bands, would prevent the implementation of this provision, special arrangements shall, to the satisfaction of the Administration, be made to ensure that persons are able to embark and disembark safely;
.1.4 the single length of pilot ladder is capable of reaching the water from the point of access to, or egress from, the ship and due allowance is made for all conditions of loading and trim of the ship, and for an adverse list of 15°; the securing strong point, shackles and securing ropes shall be at least as strong as the side ropes;
.2 an accommodation ladder in conjunction with the pilot ladder, or other equally safe and convenient means, whenever the distance from the surface of the water to the point of access to the ship is more than 9 m. The accommodation ladder shall be sited leading aft. When in use, the lower end of the accommodation ladder shall rest firmly against the ship’s side within the parallel body length of the ship and, as far as is practicable, within the mid-ship half length and clear of all discharges; or
.3 a mechanical pilot hoist so located that it is within the parallel body length of the ship and, as far as is practicable, within the mid-ship half length of the ship and clear of all discharges.

4 Access to the ship’s deck

Means shall be provided to ensure safe, convenient and unobstructed passage for any person embarking on, or disembarking from, the ship from the head of the pilot ladder, or of any accommodation ladder or other appliance, and the ship’s deck. Where such passage is by means of:

.1 a gateway in the rails or bulwark, adequate handholds shall be provided;
.2 a bulwark ladder, two handhold stanchions rigidly securing to the ship’s structure at or near their bases and at higher points shall be fitted. The bulwark ladder shall be securely attached to the ship to prevent overturning.

5 Shipside doors

Shipside doors used for pilot transfer shall not open outwards.

6 Mechanical pilot hoists

6.1 The mechanical pilot hoist and its auxiliary equipment shall be of a type approved by the Administration. The pilot hoist shall be designed to operate as a moving ladder to lift and lower one person on the side of the ship, or as a platform to lift and lower one or more persons on the side of the ship. It shall be of such design and construction as to ensure that the pilot can be embarked and disembarked in a safe manner, including a safe access from the hoist to the deck and vice versa. Such access shall be gained directly by a platform securely guarded by handrails.

6.2 Efficient hand gear shall be provided to lower or recover the person or persons carried, and kept ready for use in the event of power failure.

6.3 The hoist shall be securely attached to the structure of the ship. Attachment shall not be solely by means of the ship’s side rails. Proper and strong attachment points shall be provided for
hoists of the portable type on each side of the ship.

6.4 If belting is fitted in the way of the hoist position, such belting shall be cut back sufficiently to allow the hoist to operate against the ship’s side.

6.5 A pilot ladder shall be rigged adjacent to the hoist and available for immediate use so that access to it is available from the hoist at any point of its travel. The pilot ladder shall be capable of reaching the sea level from its own point of access to the ship.

6.6 The position on the ship’s side where the hoist will be lowered shall be indicated.

6.7 An adequate protected stowage position shall be provided for the portable hoist. In very cold weather, to avoid the danger of ice formation, the portable hoist shall not be rigged until its use is imminent.

7 Associated equipment

7.1 The following associated equipment shall be kept at hand ready for immediate use when persons are being transferred;

.1 two man-ropes of not less than 28 mm in diameter properly secured to the ship if required by the pilot;
.2 a lifebuoy equipped with a self-igniting light;
.3 a heaving line.

7.2 When required by paragraph 4, stanchions and bulwark ladders shall be provided.

8 Lighting

Adequate lighting shall be provided to illuminate the transfer arrangements overside, the position on deck where a person embarks or disembarks and the controls of the mechanical pilot hoist.

(SOLAS reg. V/23)