

Maritime Rules

Part 40C: Design, Construction and Equipment – Non-passenger Ships that are not SOLAS Ships

MNZ Consolidation

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Part objective

Part 40C prescribes the requirements for the design, construction and equipment of New Zealand non-passenger ships that are not SOLAS ships (and therefore not covered by Part 40B) and for foreign non SOLAS non-passenger ships that operate on the New Zealand coast.

The authority for making Part 40C is found in section 36(1)(a), 36(1)(c), 36(1)(d), 36(1)(g), 36(1)(i), 36(1)(j), 36(1)(p), and 36(1)(t) of the Maritime Transport Act 1994.

Maritime Rules are subject to the Regulations (Disallowance) Act 1989. Under that act the rules are required to be tabled in the House of Representatives. The House of Representatives may, by resolution, disallow any rules. The Regulations Review Committee is the select committee responsible for considering rules under this Act.

Please Note: The text within the document in **green** are identified amendments that will be addressed in the next domestic omnibus rule amendment 2017.

Disclaimer:

This document is the current consolidated version of Maritime Rules Part 40C produced by Maritime New Zealand, and serves as a reference only. It has been compiled from the official rules that have been signed into law by the Minister of Transport. Copies of the official rule and amendments as signed by the Minister of Transport may be downloaded from the Maritime New Zealand website. www.maritimenz.govt.nz

History of Part 40C

Part 40C first came into force on 1 February 2001 and now incorporates the following amendments:

Amendment	Effective date
Amendment 1	27 May 2004
Amendment 2	23 November 2006
Amendment 3	4 September 2008
Amendment 4	4 September 2008
Amendment 5	30 July 2009
Amendment 6	1 April 2011
Amendment 7	1 April 2014
Amendment 8	1 July 2014
Amendment 9	7 August 2014
Amendment 10	1 January 2015
Amendment 11	1 April 2015
Amendment 12	1 July 2016
Amendment 13	1 November 2016
Amendment 14	15 March 2018

Summary of amendments

Amendment 1

Maritime Rules Amendments Parts 20 – 90

PO, 40C.2, 40C.60(a) & (b), Appendix 2: Clause 2.3

Amendment 2

Maritime (EPIRBS) Amendment Rules 2006

40C.6(a)(iv), 40C.53(2)(b), 40C.84, Appendix 4: Clause 4.1

Amendment 3

Maritime (Portable Fire Extinguisher) Amendment

Appendix 2, Clause 2.1 & 2.3

Amendment 4

Maritime (Various Amendments) Rules 2008

40C.2, 40C.4, 40C.23(7),
40C.29(3)(b)(ii), 40C.29(3A),
40C.38(4) & (5), 40C.40(1) & (1A),
40C.41(5), 40C.41(7), 40C.43(c),
40C.47, 40C.49(e)(ii), 40C.53(7) & (8),
Appendix 1, Appendix 2: Clause 2.3,
Appendix 3: Clause 3.1-3.3

Amendment 5

Maritime (Various Amendments) Rules 2009, Part 21-80

40C.19(1)(b), Appendix 3: Clause 3.3

Amendment 6

Maritime Rules Various Amendments 2011

40C.24(4), 40C.41(3), 40C.57(2),
40C.68(2), 40C.77(1), Appendix 1:
Clause 1.3(4)(b), Appendix 2.3

Amendment 7

Parts 20, 31, 32, 34 and 35: Consequential Amendments

40C.2, 40C.6

Amendment 8

Parts 19 and 44: Consequential Amendments

40C.2, references to 'new ship' and
'existing ship', 40C.7, 40C.8, 40C.9,
40C.13, 40C.24, 40C.35, section

heading after 40C.83., 40C.84

Amendment 9

Part 40A, Part 40C, Part 40D, Part 40E, Part 40F, and Part 42A: Amendment 2014 40C.2, 40C.8, 40C.13, 40C.19, 40C.21, 40C.29, 40C.35, 40C.37, 40C.38, 40C.53, 40C.69, 40C.71, Appendix 1.3, Appendix 2.2, Appendix 2.3, Appendix 3.1, Appendix 3.2, Appendix 3.3

Amendment 10

Maritime Rules Various Amendments 2014 40C.9, 40C.12, 40C.13, 40C.43, 40C.46, 40C.62

Amendment 11

Maritime Rules Various Amendments 2015 40C.24, 40C.40

Amendment 12

Maritime Rules Various SOLAS-related Amendments 2016 40C.2, 40C.4, 40C.59, 40C.59A, 40C.59B, 40C.59C

Amendment 13

Maritime Rules Various Amendments 2016 40C.6, 40C.9, 40C.18, 40C.32, 40C.76, Appendix 2.3

Amendment 14

Maritime Rules Part 40 Series Amendments 2017 40C Appendix 1

All signed rules can be found on our website:

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General

40C.1 Entry into force

Part 40C comes into force on 1 February 2001.

40C.2 Definitions

In this Part:

Act means the Maritime Transport Act 1994;

BNWAS means bridge navigational watch alarm system;

certificate of survey means—

- (a) a certificate of survey issued by a surveyor under rule 44.41 of Part 44; or
- (b) any document that is deemed under Part 44 to be a current Certificate of Survey described in paragraph (a); or
- (c) a certificate of survey issued under section 219 of the Shipping and Seamen Act 1952 and deemed by section 468(5) of the Act to be issued or recognised as a maritime document under Part V of the Act; or
- (d) a certificate of survey issued under section 143 of the Act and saved under section 468(8) of the Act;

Certificate of Surveyor Recognition—

- (a) has the same meaning as in Part 44; and
- (b) includes any document that is deemed under Part 44 to be a valid Certificate of Surveyor Recognition;

closed cup test means a test for determining the flashpoint of a flammable liquid as prescribed in Australian/New Zealand Standards—

- (a) AS/NZS 2106.0:1999 *Methods for the determination of the flash point of flammable liquids (closed cup) – General*; and
- (b) AS/NZS 2106.1:1999 *Methods for the determination of the flash point of flammable liquids (closed cup) – Abel closed cup method*; and
- (c) AS/NZS 2106.2:1999 *Methods for the determination of the flash point of flammable liquids (closed cup) – Pensky Martens closed cup method*; and
- (d) AS/NZS 2106.5:1999 *Methods for the determination of the flash point of flammable liquids (closed cup) – Flash/no flash test - Rapid equilibrium method*; and
- (e) AS/NZS 2106.6:1999 *Methods for the determination of the flash point of flammable liquids (closed cup) – Determination of flash point - Closed cup equilibrium method*.

coastal limits has the same meaning as in Part 20;

cockpit means an exposed recess in the weather deck of a ship that extends not more than one half of the length overall of the ship;

commercial ship means a ship that is not—

- (a) a pleasure craft; or
- (b) solely powered manually; or
- (c) solely powered by sail;

current, in relation to a document means that it is valid, has not expired, and, in the case of a maritime document, has not been suspended or revoked by the Director;

enclosed water limits has the same meaning as in Part 20;

EPIRB means an electronic position indicating radio beacon;

exposed recess means a recess that is not completely enclosed by a weathertight superstructure:

first survey means the initial survey, the first annual survey, the first periodical survey, or the first renewal survey whichever is due first after the date specified in the relevant rule:

fully decked boat means a boat in which the horizontal projection of the sheerline area comprises decking with opening appliances which are weathertight. The horizontal projection of the sheerline area may also include—

- (a) a watertight self-draining cockpit complying with rule 40C.15(2)(c); and
- (b) other watertight recesses of volume less than the product of length overall x maximum beam x minimum freeboard, divided by 40 (m³):

IMO Resolution MSC.128(75) means the resolution adopted by the International Maritime Organization Assembly, titled *Performance standards for a bridge navigational watch alarm system (BNWAS)*:

inflatable boat means a boat that—

- (a) achieves its shape and buoyancy through the medium of inflation; and
- (b) is propelled by an engine:

international voyage means a voyage to or from a port outside New Zealand:

inshore limits has the same meaning as in Part 20:

length means 96 percent of the total length on a waterline at 85 percent of the least moulded depth measured from the top of the keel, or the length from the fore side of the stem to the axis of the rudder stock on that waterline, if that is the greater length. In ships designed with a rake of keel, the waterline on which this length is measured must be parallel to the designed waterline:

length overall means the length of the ship measured from the foreside of the head of the stem to the aftermost part of the transom or stern of the ship. Fittings (such as beltings, bowsprits, platforms, gantries, trim tabs, jet and outboard drive units) projecting beyond these terminal points must not be included in the length overall for the purposes of this Part. Structures (such as bulbous bows, deckhouses, free flooding bait tanks and buoyancy tubing) projecting beyond these terminal points must be included in the length overall for the purposes of this Part:¹

machinery spaces of Category A means those spaces, and trunks to such spaces, that contain—

- (a) internal combustion machinery used for main propulsion; or
- (b) internal combustion machinery used for purposes other than main propulsion where such machinery has in the aggregate a total power output of not less than 375kW; or
- (c) any oil-fired boiler or oil fuel unit:

major alterations or modifications means the alteration or modifications of a ship, including the replacement, removal or addition of—

- (a) any part of a ship, that is likely to—
 - (i) significantly affect the structural integrity, tonnage, freeboard, cargo or passenger capacity, crew or passenger accommodation, conditions of assignment of load line, watertight subdivision, stability, structural fire protection; or

¹ See the Advisory Circular to Part 40A for further guidance and interpretation of this definition.

- (ii) result in significant changes to the propulsion machinery, auxiliary machinery, steering or method of propulsion of the ship; and
- (b) any safety equipment of the ship:

major repair means a repair in respect of any damage, defect, breakdown or grounding of a ship that is likely to significantly affect the structural integrity, conditions of assignment of load line, watertight subdivision, stability, structural fire protection, main propulsion machinery, method of propulsion, steering gear, or vital auxiliary machinery of the ship:

master means any person (except a pilot) having command or charge of any ship:

New Zealand inland waters means all rivers and other inland waters of New Zealand that are navigable:

New Zealand Safe Ship Management Certificate means the certificate of that name issued under section 2 of Part 21 as in force prior to the revocation of that section by Part 19:

New Zealand Ship means a ship that is registered under the Ship Registration Act 1992; and includes a ship that is not registered under that Act but is required or entitled to be registered under that Act:

New Zealand waters means—

- (a) the territorial sea of New Zealand; and
- (b) the internal waters of New Zealand; and
- (c) all rivers and other inland waters of New Zealand:

non-passenger ship means a ship that is not a passenger ship:

offshore limits has the same meaning as in Part 20:

oil fuel unit means the equipment used for the preparation of oil fuel for delivery to an oil-fired boiler, or equipment used for the preparation for delivery of heated oil to an internal combustion engine; and includes any oil pressure pumps, filters and heaters dealing with oil at a pressure of more than 0.18 N/mm²:

open boat is a boat not protected from entry of water by means of a complete deck or by a combination of a partial weather deck and a weathertight superstructure or deckhouse:

operate on the New Zealand coast means, in the case of a commercial ship, to undertake a voyage or voyages from one New Zealand port or offshore terminal to another New Zealand port or offshore terminal or back to the same New Zealand port or offshore terminal:

owner—

- (a) in relation to a ship registered in New Zealand under the Ship Registration Act 1992, means the registered owner of the ship;
- (b) in relation to a ship registered in any place outside New Zealand, means the registered owner of the ship;
- (c) in relation to a ship to which paragraph (a) or paragraph (b) of this definition applies, where by virtue of any charter or demise or for any other reason, the registered owner is not responsible for the management of the ship, includes the charterer or other person who is for the time being so responsible;
- (d) in relation to an unregistered ship or registered ship that does not have a registered owner, means the person who is for the time being responsible for the management of the ship:

Part means a group of rules made under the Maritime Transport Act 1994:

partially decked boat means a boat in which at least two-thirds of the horizontal projection of the sheerline area is equipped with decking, cabins, shelters or rigid covers which are weathertight and designed to shed water overboard. The decked area must include all that area within one-third of the length from the bow plus the area 100 mm inboard from the periphery of the boat (excluding the transom):

Passenger means any person carried on a ship, other than—

- (a) the master and members of the crew, and any other person employed or engaged in any capacity on board the ship on the business of the ship;
- (b) a person on board the ship either in pursuance of an obligation laid upon the master to carry shipwrecked, distressed, or other persons, or by reason of any circumstances that neither the master nor the owner nor the charterer (if any) could have prevented or forestalled;
- (c) a child under the age of 1 year;

passenger ship means—

- (a) for ships that do not proceed beyond restricted limits, a commercial ship that carries any passengers; and
- (b) for ships that proceed beyond restricted limits, a commercial ship that carries more than 12 passengers;

pleasure craft has the same meaning as in section 2 of the Act:

pontoon boat means an open or decked boat—

- (a) that is constructed of metal or fibre reinforced plastic or rotationally moulded polyethelene thermoplastic; and
- (b) the intact buoyancy of which is chiefly ensured by tubular, or similar hollow or foam filled, topsides; and
- (c) that is propelled by an engine;

post-27 May 2004 ship—

- (a) means a ship—
 - (i) for which construction commences; or
 - (ii) which is converted into a non-passenger ship to which Part 40C applies, on or after 27 May 2004; and
- (b) **post-27 May 2004** in relation to any ship, boat or vessel has a corresponding meaning;

pre-27 May 2004 ship means a ship—

- (a) means a ship—
 - (i) for which construction commences; or
 - (ii) which is converted into a non-passenger ship to which Part 40C applies, before 27 May 2004; and
- (b) **pre-27 May 2004** in relation to any ship, boat or vessel has a corresponding meaning;

restricted coastal limits has the same meaning as in Part 20:

restricted limits has the same meaning as in Part 20:

rigid-inflatable boat means an open or decked boat that—

- (a) has a rigid bottom structure; and
- (b) has inflatable sides that chiefly ensure the intact buoyancy of the boat; and

(c) is propelled by an engine:

rules includes maritime rules and marine protection rules:

sailing ship means a ship that—

- (a) is designed to be navigated under wind power alone and for which any motor provided is an auxiliary means of propulsion; or
- (b) possesses a non-dimensional ratio of (sail area) divided by (volume of displacement)^{2/3} of more than 9:

series production boat means one of a series of boats built to a standard design:

ship means every description of boat or craft used in navigation, whether or not it has any means of propulsion; and includes—

- (a) a barge, lighter, or other like vessel;
- (b) a hovercraft or other thing deriving full or partial support in the atmosphere from the reaction of air against the surface of the water over which it operates;
- (c) a submarine or other submersible;

Sister ship means a ship that is—

- (a) built to the same lines plan as a pre-27 May 2004 ship that has approved stability data; and
- (b) in all respects, similar in construction and outfit as a pre-27 May 2004 ship that has approved stability data;

ship's design includes the ship's structural integrity, watertightness and weathertightness, safe means of egress and access, intact stability and reserve of buoyancy, the ship's compliance with any damage stability and buoyancy requirements, and the provision of machinery and other installed systems and equipment necessary for the safe working of the ship:

submersible craft means any craft that operates with its hull and superstructure fully submerged below the water:

surveyor means a person who holds a current Certificate of Surveyor Recognition under Part 44:

vessel means ship:

VHF (very high frequency) means the frequency spectrum between 30MHz and 300MHz:

VHF coverage area means an area defined in Appendix 3 of Part 43, being an area within the defined coverage of a 24 hour VHF coast station on channel 16 (radio telephony) and "VHF coverage" has a corresponding meaning.

watertight means capable of preventing the passage of water through the structure in any direction under a head of water for which the surrounding structure is designed:

weathertight means that in any sea condition water will not penetrate into the ship:

well deck is a weather deck, watertight against a head of 1.2 metres of seawater, which is fitted with solid bulwarks such as would impede the drainage of solid water over the sides. If the freeboard to this deck, measured from the designed load waterline is less than 250 mm the vessel shall be considered as an open boat for the purposes of subdivision, stability, and drainage requirements. The deck within the bulwarks is considered to be a weather deck unless it is completely enclosed by a weathertight superstructure.

40C.3 Application

- (1) Subject to rule 40C.3(2) and (3), this Part applies to—
 - (a) a New Zealand commercial ship that is a non-passenger ship and—
 - (i) does not proceed beyond restricted limits; or
 - (ii) is less than 45 metres in length and does not undertake an international voyage; or
 - (iii) is less than 500 gross tonnage and undertakes an international voyage; or
 - (iv) is a barge of 24 metres or more in length that does not carry any person on board during a voyage; and
 - (b) a foreign commercial ship that is a non-passenger ship and operates only on the New Zealand coast and—
 - (i) is less than 45 metres in length and proceeds beyond restricted limits; or
 - (ii) is less than 500 gross tonnage; and
 - (c) every barge that carries any person on board during a voyage within New Zealand waters.
- (2) This Part applies to ships specified in section 3 and section 4 of this Part to the extent required by those sections.
- (3) This Part does not apply to—
 - (a) a fishing ship to which Part 40D applies; or
 - (b) a sailing ship; or
 - (c) a hovercraft; or
 - (d) any submersible craft.

40C.4 Maritime New Zealand number and IMO number

- (1) The owner and the master of a ship built prior to the 4th September 2008 must ensure that the ship is permanently marked with the letters 'MSA' or 'MNZ', followed by a number issued to the ship by the Director.
- (2) The owner and the master of a ship built on or after the 4th September 2008 must ensure that the ship is permanently marked with the letters 'MNZ', followed by a number issued to the ship by the Director.
- (3) The letters and number must be—
 - (a) clearly marked; and
 - (b) dark on a light background or light on a dark background; and
 - (c) in characters at least 75 mm high; and
 - (d) located on both sides of the superstructure in a clearly visible position; or
 - (e) if no superstructure is fitted, on the transom or stern.
- (4) The owner and master of a ship of 300 gross tonnage or more that proceeds on an international voyage must ensure that the ship is permanently marked with the ship's identification number in accordance with regulation 3 of Chapter XI-1 of SOLAS not later than the first scheduled dry-docking on or after 1 January 2017.

40C.5 Additional safety equipment

The owner and master of a ship that is provided with—

- (a) life saving appliances additional to those required by rule 40C.52; or
- (b) fire appliances additional to those required by rule 40C.51; or
- (c) radiocommunication equipment additional to that required by rule 40C.53;

must ensure that the additional appliances and equipment meet the standards required by this Part and are well maintained and in good working order.

40C.6 Condition under which restricted limit or coastal limit ships are permitted to make voyages in coastal or offshore limits

The owner and master of a ship that has been assigned restricted limits or coastal limits under rule 20.20 and is making a single voyage in the coastal limits or offshore limits (as applicable) as permitted under rule 20.43 must ensure that—

- (a) the ship is provided with at least the following safety equipment:
 - (i) a liferaft that complies with rule 42A.11 and 42A.12 and is able to carry the number of persons carried on the ship; and
 - (ii) one lifejacket that has a buoyancy of 100N complies with rule 42A.19 for each person carried on the ship; and
 - (iii) 4 rocket parachute flares that comply with rule 42A.22 and 2 buoyant smoke floats that comply with rule 42A.24; and
 - (iv) a 406 MHz EPIRB that complies with the requirements of rule 43.18A or 43.19; and
 - (v) A VHF radio that complies with rule 43.12; and
 - (vi) in the case of a ship making a single voyage within coastal limits, if proceeding outside the VHF coverage area, a radio installation enabling radio communication to the satisfaction of a surveyor; and
 - (vii) in the case of a ship making a single voyage in offshore limits, if proceeding outside the VHF coverage area, a radio installation that meets the requirements of rule 43.14; and
- (b) the ship is provided with up to date charts and nautical publications relevant to the areas covered by the proposed voyage; and
- (c) the crew of the ship meet the minimum crewing and qualification requirements of Part 31, whichever applies, of the maritime rules for a ship that proceeds into coastal or offshore limits, as applicable; and
- (d) the voyage is made only under favourable weather conditions with a favourable weather forecast.

40C.7 Design

- (1) Subject to rule 40C.7(2), (3) and (4), the owner of any ship must ensure that—
 - (a) if the ship is a post-27 May 2004 ship, either—
 - (i) the ship's design is approved² by a surveyor who holds a current Certificate of Surveyor Recognition that entitles the surveyor to perform that function as—
 - (aa) fit for its intended use and intended operating limits; and
 - (bb) complying with all applicable maritime and marine protection rules; or
 - (ii) where rule 40C.9(2) applies, the ship is certified in accordance with that rule; and
 - (b) if the ship is a pre-27 May 2004 ship to which rules 40C.9(4)(a) and (b) do not apply, the ship's design is approved by a surveyor who holds a current Certificate of Surveyor Recognition that entitles the surveyor to perform that function as—
 - (i) fit for its intended use and intended operating limits; and
 - (ii) complying with all applicable maritime and marine protection rules; and
 - (c) if the ship undergoes major alteration or its operating limits are permanently changed, the ship's design is approved by a surveyor who holds a current

² Approval of the ship's design does not guarantee any performance of the ship other than in respect of sufficiency and compliance with maritime and marine protection rules of those elements included in the definition of ship's design in rule 40C.2

Certificate of Surveyor Recognition that entitles the surveyor to perform that function as—

- (i) fit for its intended use and intended operating limits; and
- (ii) complying with all applicable maritime and marine protection rules.

(2) A post-27 May 2004 ship of less than 7.5 metres in length overall does not require approval of the ship's design if it is a series production boat and the design has a record of at least 5 years of safe operation under similar conditions to that intended for the post-27 May 2004 ship.

(3) A pre-27 May 2004 ship that has certificate of survey that was issued before 1 February 1998 is considered to have had its design approved for the operating limits and service indicated on the certificate of survey.

(4) A pre-27 May 2004 ship of less than 7.5 metres in length overall to which rule 40C.7(3) does not apply does not require approval of the ship's design if the ship, or a ship of the same design and construction, has a record of at least 5 years of safe operation in the intended use and similar area of operation.

40C.8 Survey

(1) Unless a surveyor is satisfied of the relevant matters set out in subrule (2), a surveyor must not—

- (a) issue a certificate of survey; or
- (b) subject to the Director's power to prescribe the extent of survey in that provision, report a satisfactory survey for the purpose of Part 44.

(2) For the purpose of subrule (1) the matters are—

- (a) the ship's design has been approved in accordance with rule 40C.7 and 40C.35; and
- (b) for a ship to which section 1 of this Part applies, the ship—
 - (i) complies with rules 40C.12 to 40C.60 inclusive, and the requirements of Part 50, as may be applicable for that ship; and
 - (ii) is provided with the equipment required by Parts 22³ and 45⁴; as may be applicable for that ship; and
- (c) for a pilot boat to which section 2 of this Part applies, the boat—
 - (i) complies with rules 40C.12 to 40C.60 inclusive, and the requirements of Part 50, as may be applicable for that boat; and
 - (ii) is provided with the equipment required by Parts 22 and 45, as may be applicable for that boat; and
 - (iii) complies with 40C.62 and 40C.63; and
- (d) for a marine farming vessel to which Section 3 of this Part applies, the vessel—
 - (i) complies with rules 40C.66 and 40C.67 and the requirements of Part 50, as may be applicable to that vessel; and
 - (ii) complies with rule 40C.68 and Parts 22 and 45, as may be applicable to that vessel; and
- (e) for a barge to which section 4 of this Part applies, the barge complies with rules 40C.71 to 40C.83 inclusive and the requirements of Part 22, as applicable for that barge.
- (f) the ship and the ship's equipment are in all respects fit for its intended use and operating limits; and

³ Part 22 – Collision Prevention includes requirements for distress equipment to be carried.

⁴ Part 45 – Navigation Equipment.

- (g) all applicable maritime rules and marine protection rules are complied with.
- (3) The owner and the master of a ship must ensure that after the survey that takes into account those matters prescribed in subrule (2), no changes are made in the structure, equipment, arrangements, material, or scantlings covered by those matters without the approval of a surveyor.

40C.9

Construction

- (1) The construction of a ship must provide strength for the safe operation of the ship to withstand the sea and weather conditions likely to be encountered in the intended area of operation, assuming the ship is operated at its service draught and driven prudently at its maximum service speed.
- (2) A post-27 May 2004 ship complies with rule 40C.9(1) if it is constructed under survey and is—
 - (a) certified as being in accordance with hull or full certification standards for the ship's operating limits by any one of the following classification societies:
 - American Bureau of Shipping
 - Bureau Veritas
 - DNV GL AS, DNV GL, DNV, or GL
 - Lloyd's Register of Shipping
 - Nippon Kaiji Kyokai; or
 - (b) certified by any one of the marine safety authorities of a State or Territory of the Commonwealth of Australia as being in accordance with the requirements of the *Uniform Shipping Laws Code* published by the Australian Transport Advisory Council, if the operating limits stated in that certification are considered by the Director to be equivalent to the ship's operating limits in New Zealand.
- (3) A post-27 May 2004 ship of 7.5 metres or more in length overall that is not built in accordance with rule 40C.9(2) must be constructed under survey by a surveyor who holds a Certificate of Surveyor Recognition that entitles the surveyor to perform that function.
- (4) A pre-27 May 2004 ship complies with rule 40C.9(1) if it is in good repair and—
 - (a) was built to one of the standards referred to in rule 40C.9(2) for post-27 May 2004 ships and a current certificate referred to in either rule 40C.9(2)(a) or 40C.9(2)(b) exists for the ship; or
 - (b) was built to one of the standards referred to in rule 40C.9(2) for post-27 May 2004 ships and, where no current certificate referred to in either rule 40C.9(2)(a) or 40C.9(2)(b) exists for the ship, a surveyor is satisfied following a structural survey of the ship that the ship continues to meet the standard; or
 - (c) has a certificate of survey that was issued before 1 February 1998, and a surveyor is satisfied following a structural survey of the ship that the ship's condition is adequate for its intended purpose; or
 - (d) has undergone:
 - (i) design approval in accordance with rule 40C.7(1)(b); and
 - (ii) a survey by a surveyor and the surveyor is satisfied that the ship's condition is adequate for its intended purpose.
- (5) A rigid hulled ship must meet the following requirements:
 - (a) it must be constructed of wood, fibre reinforced plastic (FRP), aluminium alloy or steel, a combination of such materials or of other material that the Director considers provides equivalent performance;
 - (b) if it proceeds beyond enclosed waters, it must be fitted with—

- (i) a watertight weather deck, which may be a well deck, over the length of the ship; and
- (ii) shelter for the total number of persons carried which is suitable for the sea and weather conditions likely to be encountered in the intended area of operation;

unless the ship is an open boat to be assigned inshore limits, in which case a surveyor must be satisfied that the boat complies with rules 40C.13(2) and 40C.16; and

- (c) if a cockpit is fitted, the cockpit must be watertight and self draining.

(6) (a) A post-27 May 2004 inflatable boat or rigid-inflatable boat must comply with the requirements of Appendix 5.

(b) Any pre-27 May 2004 inflatable boat or rigid inflatable boat must comply with the requirements of Appendix 5 within 1 year of this Part coming into force.

(7) A pontoon boat must—

- (a) be constructed of aluminium alloy, steel, FRP or polyethelene thermoplastic or of any other material that the Director considers provides equivalent performance; and
- (b) comply with the applicable requirements of Appendix 5 for rigid and inflatable boats and the stability, swamp and freeboard tests of Annex 1 of that Appendix; and
- (c) if it is assigned inshore limits by a surveyor, comply with rule 40C.16.

(8) A ship that is designed to carry dangerous chemicals in bulk must be constructed in accordance with, and meet the requirements of, the *International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code)* adopted by resolution MSC.4(48) of the International Maritime Organization.

(9) Any ship that is designed to carry liquefied gases in bulk must be constructed in accordance with, and meet the requirements of, the *International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code)* adopted by resolution MSC.5(48) of the International Maritime Organization.

Section 1 – General non-passenger ships

General

40C.10 Application of section 1

Rules 40C.10 to 40C.60 inclusive apply to any non-passenger ship that—

- (a) is used as a cargo ship, workboat, tug, pilot boat, dredger, offshore supply ship, police boat, crew boat, research ship (other than fisheries research⁵), harbour work or patrol craft, hydrographic ship, pollution control craft or floating crane; or
- (b) is a sports fishing boat, training ship, excursion or cruise ship, proceeding beyond restricted limits and carrying not more than 12 passengers.

40C.11 Definitions relating to section 1

In section 1:

authorised person means a person employed by the organisation to whose approved safe ship management system the ship in question belongs who has delegated powers from the Director to issue and suspend or to issue or to suspend certain maritime documents under Part V of the Maritime Transport Act 1994, under an instrument of delegation made under section 444 of the Maritime Transport Act 1994:

⁵ Fisheries research ships are covered by Part 40D Design, Construction and Equipment – Fishing Ships.

cargo means any goods carried for reward other than—

- (a) the personal luggage of passengers; and
- (b) perishable goods not exceeding 100 kilograms in total weight:

crew boat means any ship that is used to ferry crew or workers during their employment from ship to shore or the converse, or from any other point of embarkation to point of disembarkation during their employment:

cruise ship means any ship that carries berthed passengers on a voyage:

design waterline means the deepest load line at which the ship is designed to operate:

dredger means any navigable ship that is used to dredge spoil from the bed of a river, harbour or the sea:

excursion ship means any ship that carries passengers on a voyage with the intention of returning to its starting point:

freeboard deck for ships of 24 metres or more in length that are load line ships, has the same meaning as in Part 47. For other ships, it means the uppermost deck having means of watertight closure and below which all openings in the sides of the ship have means of watertight closure:

offshore supply ship means any ship that is used to service an offshore structure or installation:

personal luggage means luggage carried on board by passengers:

pollution prevention craft means any ship used for the purposes of limiting, containing, removing or otherwise controlling a marine pollutant:

pilot boat means any ship used to transfer pilots between the shore and a ship:

sports fishing boat means any ship that only carries passengers who will participate in recreational fishing during the voyage:

training ship means any ship that carries passengers on a voyage for the purpose of instructing them in navigation, boat handling or other nautical training purposes:

tug means any ship designed for the purpose of towing, pushing or otherwise manoeuvring other ships:

workboat means any ship used by persons or an employer as transport or otherwise for the purposes of their trade or occupation.

Subdivision and stability

40C.12 Subdivision

- (1) Except as provided in rule 40C.12(2), a post-27 May 2004 ship of 15 metres or more in length overall must be fitted with a vertically continuous collision bulkhead that is—
 - (a) watertight up to the freeboard deck; and
 - (b) located not less than 5 percent of the length overall, and not more than 15 percent of the length overall, abaft the foreside of the stem measured at the design waterline.
- (2) For ships of less than 20 metres in length overall, the collision bulkhead may be stepped, provided that—
 - (a) the bulkhead below the step is located not less than 5 percent of the length overall abaft the stem at the design waterline; and

- (b) the continuation of the bulkhead to the freeboard deck above the step is located at a distance not less than 1.5 percent of the length overall abaft the stem, measured at the top of the step; and
- (c) the top of the step must not be less than 2.5 percent of the length overall above the design waterline.

- (3) (a) Doorways and other access openings must not be fitted in the collision bulkhead below the freeboard deck, except that in ships of 20 metres in length overall or less, a surveyor may permit a single watertight manhole, of the minimum practical opening required for access, to be fitted if—
 - (i) it is located as high as possible in the collision bulkhead; and
 - (ii) there is no other practical location for access to the space forward of the collision bulkhead.
- (b) Except as provided in rule 40C.12(3)(c), pipes passing through the collision bulkhead must be fitted with valves operable from above the freeboard deck.
- (c) Where the fore peak is not used as a tank and the space immediately aft of the collision bulkhead is not a machinery or cargo space, the fore peak may be drained by a cock secured on the after side of the bulkhead. The cock must be—
 - (i) operable from a readily accessible and protected position aft of the bulkhead; or
 - (ii) of a self closing type.

- (4) Where a forecastle is fitted to a ship and the forecastle extends aft of the position of the collision bulkhead, the bulkhead must be extended weathertight to the next deck above the freeboard deck. Openings in the extension above the freeboard deck must be the minimum necessary for the operation of the ship and must be provided with weathertight closing arrangements.
- (5) A post-27 May 2004 ship of 12 metres or more in length overall must have watertight bulkheads at each end of the main propulsion machinery space.
- (6) A post-27 May 2004 offshore supply ship of 24 metres or more in length must meet the subdivision requirements of Part 3 of the *Guidelines for the Design and Construction of Offshore Supply Vessels* adopted by Resolution A.469(XII) of the Assembly of the International Maritime Organization.

40C.13

Stability

- (1) The intact stability of a post-27 May 2004 fully decked ship must be determined in accordance with Appendix 1 of this Part.
- (2) For a post-27 May 2004 ship of less than 6 metres in length overall that is a monohulled open boat, it must be demonstrated by test or calculation that, when fully swamped, the ship has sufficient buoyancy distributed so that the boat will stay afloat and in good trim, without listing if flooded. The test or the calculation must include the full outfit of equipment, the total number of persons that is permitted to carry and a mass equivalent to its engine and full tank or tanks of fuel.⁶
- (3) A ship fitted with or carrying a deck crane or other lifting device must be a decked ship and meet the intact stability requirements of Appendix 1.
- (4) A ship that is engaged in towing operations must be a decked ship and meet the intact stability requirements of Appendix 1. The towing gear must be designed to minimise any overturning moment that may arise as a result of the lead of the towline.⁷

⁶ For details of a recommended swamping calculation and test for open boats see the Advisory Circular to this Part of the maritime rules.

⁷ See also rule 40C.60.

- (5) A post-27 May 2004 offshore supply ship of 24 metres or more in length must meet the damage stability requirements of Part 3 of the *Guidelines for the Design and Construction of Offshore Supply Vessels* adopted by Resolution A.469(XII) of the Assembly of the International Maritime Organization.
- (6) Where a ship is fitted with permanent solid ballast in order to meet the requirements of Appendix 1 of this Part,—
 - (a) the ballast must be placed and secured to the satisfaction of a surveyor;⁸ and
 - (b) the ballast must not be a material that may impair the adjacent ship structure; and
 - (c) a record of the weight, location, and nature of the ballast must be documented in—
 - (i) the survey plan required by Part 19; or
 - (ii) in any case where the transitional provisions of Part 19 apply, the documentation associated with the ship's safe ship management system.
- (7) The stability requirements of this rule do not apply to any ship that is an inflatable or rigid inflatable boat that must comply with Appendix 5 of this Part.

40C.14 Pre-27 May 2004 ships' stability

- (1) A pre-27 May 2004 ship that has been surveyed and issued with a certificate of survey is not required to comply with rules 40C.12 and 40C.13, if it has not, since the issue of the certificate of survey, undergone—
 - (a) major repairs, alterations or modifications; or
 - (b) a change of use; or
 - (c) in the case of a ship that is not a restricted limit ship, a change of operating limits that permits the ship to proceed beyond the limits previously assigned.
- (2) Pre-27 May 2004 ships that do not comply with rule 40C.14(1), and were engaged in non-passenger services that did not require survey of the ship under the Maritime Transport Act 1994 prior to 1 February 1998, must, where applicable, comply with rules 40C.12 and 40C.13⁹ before 1 February 2003, except that an existing open boat need not comply with rule 40C.13(2) if the boat has a record of at least 5 years of safe operation in the intended area of operation.
- (3) Pre-27 May 2004 ships not referred to in rules 40C.14(1) or (2) must comply with rules 40C.12 and 40C.13, as may be applicable, from the date that this Part comes into force.

40C.15 Freeboard

- (1) Ships that are 24 metres or more in length, or less than 24 metres in length and carry cargo, must comply with Part 47.
- (2) Subject to rules 40C.15(3) and (5), ships that are less than 24 metres in length and do not carry cargo, must have the following minimum freeboards when upright in still water and loaded with fuel, water and stores, and weights representing the total number of persons to be carried (calculated as 75 kgs per person):
 - (a) in the case of a ship with a continuous weather deck, a freeboard measured down from the lowest point of the weather deck of not less than 375 mm for a ship of 6 metres or less in length overall and not less than 750 mm for a ship of 18 metres or more in length overall. For a ship of intermediate length overall, the freeboard must be determined by linear interpolation:
 - (b) in the case of either an open or partially open ship, a clear height of side (that is, the distance between the waterline and the top of the gunwale or capping or to the top of the wash strake if fitted above the capping) of not less than 400 mm for a

⁸ Where necessary and practical it is recommended that the ballast be capable of being removed to permit inspection of the ship's hull.

⁹ Where an pre-27 May 2004 ship is already fitted with permanent ballast and its weight is unknown, only the presence of that ballast and its location need be recorded.

ship of 6 metres or less in length overall and not less than 800 mm for a ship of 18 metres or more in length overall. For a ship of intermediate length overall, the clear height must be determined by linear interpolation:

- (c) in the case of a ship fitted with a cockpit, the height of the cockpit sole above the water at the lowest point must not be less than 250 mm, but a surveyor may permit a lesser height if it can be shown—
 - (i) that the ship has a reserve of buoyancy; and
 - (ii) its stability remains intact when the cockpit is full of water; and
 - (iii) if the cockpit is self draining, it is capable of self draining within 3 minutes.
- (3) Ships that are less than 15 metres in length overall that do not proceed beyond restricted limits and are fitted with a raised weathertight fore deck structure and flush weathertight deck with bulwarks aft, may have a minimum freeboard of 250 mm, if—
 - (a) openings in the deck are kept to a minimum and are provided with weathertight closing arrangements; and
 - (b) openings to the weathertight raised structure forward of the aft deck have sills of at least 250 mm height; and
 - (c) bulwarks are fitted with water freeing arrangements in accordance with rule 40C.21(3), whether or not the ship is less than 12 metres in length overall.
- (4) The minimum freeboard or clear height of side of a ship must not be less than that required to meet any requirement of rule 40C.13.
- (5) The freeboard requirements of rule 40C.15 do not apply to any ship that is an inflatable or rigid-inflatable boat, or pontoon boat, that is required to comply with Appendix 5 of this Part.

Accommodation

40C.16 Shelter and passenger accommodation

- (1) The owner of a ship must ensure that, where the ship proceeds beyond enclosed water limits, the ship has spaces that provide shelter from the weather for the total number of persons that may be carried. Such sheltered spaces may be open at the after end in ships that do not proceed beyond inshore limits.
- (2) The owner of a ship that proceeds beyond restricted limits and carries 12 or less passengers must ensure that the ship complies with the applicable requirements of rules 40A.16 to 40A.21 inclusive of Part 40A of the maritime rules.

40C.17 Crew accommodation

The following requirements apply to crew accommodation on a ship to which Part 51 does not apply that are ships of 12 metres or more in length overall and normally engaged on voyages of 36 hours or more, or ships in which crew are required to sleep on board:

- (a) the location, structure, and arrangement of the crew accommodation must ensure security, protection against the weather and the sea, and insulation from heat, cold, and noise. Crew accommodation spaces must not be located forward of the collision bulkhead;
- (b) bulkheads and decks between accommodation spaces and machinery spaces, fuel tanks, galleys, engine, deck and other store rooms, drying rooms, communal wash places or wc, must be constructed so as to prevent the infiltration of fumes and odours. Direct openings into sleeping rooms from such places must be avoided wherever reasonable or practicable. That part of the bulkhead separating such places from sleeping rooms, and also external bulkheads, must be gastight and, where necessary, must prevent the passage of water;

- (c) all internal surfaces must be of a material that is easily kept clean, and is impervious to damp;
- (d) unless otherwise approved by a surveyor, the clear headroom in areas of free movement throughout the crew accommodation must be not less than 1.9 metres;
- (e) a surveyor must be satisfied that the crew accommodation spaces are provided with adequate ventilation to ensure sufficient air changes for a comfortable living environment and have lighting that allows a person with normal vision to read in that space;
- (f) wherever practicable, access to sleeping rooms must be through a doorway. If access is to be from the main deck to below, it must be by way of an inclined ladder or stairway;
- (g) where a hazard (such as a galley area) is located between a sleeping room and the open deck, an emergency escape from the sleeping room must be provided;
- (h) at least two widely separated means of escape must be provided at all levels of crew accommodation:
- (i) each crew member must be provided with an individual bunk, the minimum inside dimensions of which must be 1.9 metres by 0.68 metres. Where appropriate, on small ships, a surveyor may permit the foot of the bunk to be tapered;
- (j) the clearance above any bunk must not be less than 600 mm. The lowest bunk must not be less than 300 mm above the deck;
- (k) bunks must not be placed side by side in such a way that access to one bunk can only be obtained over another bunk. The minimum clear deck space between bunks must be at least 600 mm;
- (l) when one bunk is placed over another, a dustproof base of wood or other suitable material must be fitted to the upper bunk;
- (m) each bunk must be fitted with a mattress of a type that will not attract pests or insects. The mattress and cover must be of non-flammable material;
- (n) each crew member must be provided with adequate storage space in the form of a locker for the storage of personal items and clothes;
- (o) adequate toilet, messing, catering and beverage facilities must be provided for the total crew complement. For every 8 crew members or less, there must be one flush toilet or suitable alternative, one shower or bath and one wash basin. Each shower, bath and wash basin so provided must be supplied with hot and cold fresh water.

Watertight and weathertight integrity

40C.18 Watertight integrity

- (1) The number of openings in a ship's sides below the weather deck must be kept to a minimum.
- (2) For any ship to which Part 47 does not apply, inlets and discharges through the ship's hull must comply with rule 40C.32.¹⁰
- (3) All portlights fitted in the side of a ship below the freeboard deck must—
 - (a) be fixed; and
 - (b) must be fitted in a position where their sills are on or above a line that—
 - (i) is drawn parallel to the freeboard deck at the ship's side; and
 - (ii) has its lowest point at least 500 mm above the design waterline.

Deadlights must be fitted to all portlights in the sides of a ship. Portlights, their glasses and deadlights must be constructed to the satisfaction of a surveyor.¹¹

¹⁰ Part 47 applies to ships of 24 metres or more in length, ships carrying cargo, and barges operating within coastal limits. For requirements regarding inlets and discharges led through the ship's hull see Part 47.

40C.19 Weathertight integrity

(1) (a) The freeboard deck and every deck above the freeboard deck must be weathertight and provided with freeing arrangements capable of rapidly clearing the deck of water under all weather conditions.

(b) For a ship that is not required to comply with Part 47, the height above deck of the coamings of hatchways and the permanent weathertight sills of openings in deckhouses or companionways that give access into spaces below the weathertight deck must comply with Table 40C.1 and associated notes.

(c) Where operating experience has shown justification, and on approval by the surveyor, and where the covers are other than wood, the height of coamings (hatches only) may be reduced, or the coamings omitted entirely, provided that the safety of the ship is not thereby impaired. In such cases, the hatchway opening must be kept as small as practicable and the covers permanently attached by hinges or equivalent means. The covers must be capable of being rapidly closed, and battened down or otherwise secured by arrangements that are acceptable to the surveyor.

Table 40C.1

Operating Limit	Length overall of ship	Height of coaming or sill
Offshore, Coastal, Restricted Coastal	6m or more but less than 18m 18m or more but less than 24m 24m and over	300 mm 300 + 50(L-18) mm 600 mm
Inshore	Less than 10m 10m or more but less than 18m 18m and over	150 mm 200 mm 250 mm
Enclosed Water	All length	150 mm

Notes

1. L is length overall.
2. Openings in deckhouses or companionways that give access into spaces below the weathertight deck and that are located in cockpits, wells or in exposed positions on the weathertight deck must be fitted with weathertight doors.
3. All hatches exposed to the weather must be weathertight. Covers or closures for all hatches on weathertight decks, trunks or cabin tops must be fitted with securing devices and must be attached to the hatch coaming or frame to prevent them coming adrift. Escape hatches that lead to crew or passenger accommodation must be capable of being opened from both sides.

(2) (a) Ventilators on a ship that are not subject to the requirements of Part 47 must have the coaming heights above deck shown in Table 40C.2.

Table 40C.2

Length overall of ship	Minimum height above deck	
	On weather deck	On superstructure deck
less than 24 m	600 mm	375 mm
24 m or more but less than 35 m	760 mm	450 mm

(b) Where the coaming height exceeds 900 mm, it must be firmly supported.

¹¹ It is recommended that portlights and deadlights comply with the requirements of the standard ISO 12216—Windows, portlights, hatches, deadlights, and doors — Strength and tightness requirements.

- (c) Ventilators must be capable of being closed weathertight by devices permanently attached to the ventilator or adjacent structure, but closing devices are not required for ventilators in the following circumstances:
 - (i) where the height of the ventilator is 300 mm or more above the weather deck—
 - (aa) on ships, other than tugs, that do not proceed beyond enclosed limits; and
 - (bb) on ships of less than 10 metres in length overall that do not proceed beyond a restricted coastal limit; and
 - (ii) on ships of less than 15 metres in length overall, if the height of the ventilator is 1 metre or more above the weather deck and is positioned not more than 0.25 of the moulded breadth from the centre line of the ship; and
 - (iii) on ships of 15 metres in length overall or more but less than 24 metres in length overall, if the height of the ventilator is 2 metres or more above the weather deck and is positioned not less than 0.25 of the moulded breadth from the centre line of the ship; and
 - (iv) where the height of the ventilator exceeds 4.5 metres above the weather deck.
- (3) (a) Except as provided in rule 40C.19(3)(b), air pipes to tanks and other spaces below the weather deck that are not subject to the requirements of Part 47 must have efficient means of watertight closure permanently attached to the pipe or adjacent structure.
 - (b) On ships that do not proceed beyond enclosed waters, closing devices are not required for air pipes having a gooseneck, other than for air pipes fitted to tugs, if the height of the pipe above the deck to the point where water may have access below is 300 mm or more.
 - (c) On ships proceeding beyond enclosed waters, the height of air pipes above deck to the point where water may have access below must be at least 760 mm on the weather deck and at least 450 mm on the superstructure deck. A surveyor may allow a reduction of the height above deck of an air pipe to avoid interference with the operation of a ship, if the safety of the ship is not adversely affected.
- (4) Suitable permanently transparent material must be fitted in all wheelhouse windows¹² and the windows of other structures above the weather deck. Where glass is used, it must be toughened safety glass. The thickness of glass or other material used and the means of securing the windows and the width of the bearing surfaces must be acceptable to a surveyor.¹³

Protection of personnel

40C.20 Bulwarks, guard rails and handrails

A ship to which Part 47 does not apply must be provided with bulwarks, guard rails, and other protection as follows:

- (a) bulwarks or fixed guard rails must be fitted near the edge of every exposed deck to which passengers and crew have normal access but, where the fitting of guard rails and bulwarks is impracticable, a surveyor may permit the omission of such rails or bulwarks, if adequate grab rails and toe rails together with safe footing are provided:
- (b) except as provided in rule 40C.20(g), for post-27 May 2004 ships, the height of guard rails or bulwarks above the deck on decks to which passengers have access must be not less than the height shown in Table 40C.3:

¹² See also rule 40C.59(2).

¹³ See reference to standard at footnote 12.

Table 40C.3

Length overall of ship	Minimum height
20 metres or more	1000 mm
16 metres or more but less than 20	850 mm
10 metres or more but less than 16	750 mm
less than 10 metres	To be determined by surveyor in each case

- (c) the openings between guard rails on decks to which passengers have access must not exceed 230 mm unless all or part of the space below the upper rail course is fitted with strong wire mesh or equivalent. On other decks, the distance between the lowest course and the deck must not exceed 230 mm and the distance between other courses must not exceed 380 mm;
- (d) storm rails or hand grabs must be installed where considered necessary by a surveyor for safe movement in passageways, at deckhouse sides, and at ladders and hatches where passengers and crew have normal access;
- (e) on a ship carrying vehicles, effective barriers, chains or cables must be installed at the open ends of any vehicle deck;
- (f) on a ship fitted with a cockpit that opens aft to the sea, the opening must not have an unprotected opening width greater than 500 mm;
- (g) on a ship that is engaged only in recreational fishing excursions, the height of bulwarks or guard rails is not required to exceed 850 mm above deck;
- (h) except as provided in rule 40C.20(a), decks to which only crew have access must have guard rails or bulwarks of the minimum height given in Table 40C.3, unless a surveyor considers a lesser height is safe;
- (i) a ship that proceeds beyond restricted limits must be provided with at least 2 safety harnesses, and additional safety harnesses where necessary for all persons required to work on or above exposed decks;
- (j) efficient means for securing the life lines of safety harnesses must be provided on exposed decks and fastening points must be arranged, having regard to the likely need for work on or above deck.

40C.21**Water freeing arrangements**

- (1) Except as provided in rule 40C.21(3), (4) and (7), where bulwarks on weather parts of a deck form wells, the minimum, freeing port area of ships of 24 metres or more in length must comply with the requirements of rule 40A.26(1)(a)(i), and for ships of less than 24 metres—
 - (a) must comply with rule 47.65(5), if the ship carries cargo; or
 - (b) must be at least 4 percent of the area of the bulwark, if the ship does not carry cargo.
- (2) The minimum freeing port area for each well on an open weather superstructure deck must be not less than one half the area established under rule 40C.21(1).
- (3) A ship of less than 12 metres in length overall that does not proceed beyond restricted limits and has a well deck aft that is fitted with bulwarks all round must be provided with—
 - (a) freeing ports having the minimum area required by rule 40C.21(1); or
 - (b) a minimum of two freeing ports fitted (one port and one starboard) in the transom, each having a clear area of at least 225 square centimetres.
- (4) If a ship has only small side deck areas in which water can be trapped, a surveyor may accept a smaller freeing port area, if the surveyor is satisfied that the volume of water that may become trapped in the side deck areas will not unduly affect the ship's stability.

- (5) Except as provided in rule 40C.21(7), freeing ports must be so arranged along the length of bulwarks as to ensure that the deck is freed of water rapidly and effectively. Freeing ports must be located in the lower third of the bulwark height, as near to the deck as practicable.
- (6) If freeing port covers are fitted, a surveyor must be satisfied that the covers will not restrict freeing of water while they are in service.
- (7) If freeing ports cannot be fitted in a ship, a surveyor must be satisfied that other efficient means of clearing trapped water from the ship is provided.
- (8) If a cockpit is fitted in the weather deck in a ship, the ship must—
 - (a) comply with rule 40C.15(2)(c); and
 - (b) be provided with efficient non-return means of drainage overboard.

40C.22 Surface of working decks

- (1) The surface of every working deck must be non-slip.
- (2) The surface finish of every hatch cover fitted on a working deck must be non-slip.
- (3) In an inflatable boat or rigid inflatable boat, the upper surface of the inflated buoyancy tube must be provided with a non-slip finish.

Bilge drainage

40C.23 Bilge pumping arrangements

- (1) Except as provided in rules 40C.23(2) and (4), a ship must be provided with a pumping system capable of pumping from and draining any watertight compartment in the ship.
- (2) (a) A watertight compartment filled with a buoyancy material approved by a surveyor under rule 40C.23(2)(c) is not required to have bilge pumping arrangements.
(b) A watertight compartment of less than 7 percent of the total under deck volume may be drained into an adjacent compartment by means of a self-closing valve or cock if the valve or cock—
 - (i) is fitted outside the compartment to be drained; and
 - (ii) is operable from a readily accessible position (other than where the valve is fitted in the collision bulkhead and complies with rule 40C.12(3)(c)(ii)).
(c) A surveyor may approve the use of low-density foam or other media to provide buoyancy in void spaces, provided the medium is—
 - (i) impervious to water absorption; and
 - (ii) structurally stable under service conditions; and
 - (iii) chemically inert in relation to the structural materials and any other medium with which it may be in contact; and
 - (iv) properly secured in place; and
 - (v) easily removable for inspection of the void space.
- (3) The bilge system in post-27 May 2004 ships of 24 metres or more in length overall must be provided with a bilge distribution box located in an accessible position and the valves in the bilge distribution box must be of a non-return type.
- (4) An open boat or partially open boat of less than 6 metres in length may be provided with a bailing device acceptable to a surveyor, instead of a bilge system, if there is ready access to the bilge for bailing. Sealed watertight compartments that are made of the hull construction material and integral with the hull or deck structure in such boats are not required to have bilge drainage arrangements if the boat complies with the requirements of rule 40C.13(2).

40C.24 Bilge pumps

(1) Except as provided in rule 40C.24(2), post-27 May 2004 ships that are decked ships must be provided with the number, capacity and type of bilge pumps specified in Table 40C.4 in accordance with the associated notes.

Table 40C.4

		Manual		Power	
Limits	Length O.A.	No.	Capacity	No.	Capacity
Enclosed waters	< 15m	1	5.5 kl/hr	—	—
	15m – 45m	1	5.5 kl/hr	1a	11.0 kl/hr
Inshore and Restricted Coastal	< 15m	1	5.5 kl/hr	1a	11.0 kl/hr
	15m – 45m	—		2b	11.0 kl/hr
Coastal and Offshore	15m – 30m	—	—	2b	11.0 kl/hr
	30m – 45m	—		2C	15.0 kl/hr

Notes

- a independent power pump or pump driven from main engine.
- b both independent power pumps or one pump driven from main engine.
- c both independent power pumps.

1. A power pump may be substituted for a manually operated pump.
2. An independent power pump may be driven by an auxiliary engine or by an electric motor, but where 2 power pumps are required,—
 - (a) neither pump may be dependent on the same source of power; and
 - (b) the pumps and bilge system must be arranged to permit concurrent operation of the 2 pumps.
3. Where a ship is required to be fitted with 2 power pumps and the capacity of one of those pumps is no more than 20 percent less than the specified capacity, the deficiency may be made good by an equivalent excess of capacity in the other power pump.
4. A bilge pump must be of a self priming type or be provided with a suitable priming device.
5. Capacity shown in Table 40C.4 is the discharge capacity, as installed, in kilo-litres per hour.
6. Manual pumps must be operable from above the weather deck.
7. If independent bilge mains are fitted in the hulls of a multi-hulled ship, each independent bilge main must have two powered pumps if the ship is required by Table 40C.4 to have two powered pumps.

(2) In post-27 May 2004 ships of less than 24 metres in length overall and in post-27 May 2004 multi-hulled ships, each watertight compartment may be drained by at least one fixed electrically driven submersible bilge pump instead of a bilge main, if the following requirements are met—

- (a) the total capacity of the submersible bilge pumps (Q_t) is not less than

$$Q_t = 0.0138 d_m^2 \text{ metres}^3/\text{hour}$$

Where d_m is defined in rule 40C.25(3); and

(b) the capacity of each separate submersible bilge pump (Q_n) is not less than—

$$Q_n = \frac{Q_t}{(N-1)} \text{ metres}^3/\text{hour}$$

where N = number of fixed submersible bilge pumps; and

(c) the capacity of the fitted submersible bilge pumps in any one compartment is at least 8 metres³/hour; and

(d) in the main machinery space there are at least two means of bilge suction, only one of which is a submersible bilge pump;¹⁴ and

(e) each submersible bilge pump is fitted with a float switch that automatically operates the pump or an audible alarm at the steering position. The float switch must be protected from jamming caused by bilge debris; and

(f) each submersible bilge pump has a visual alarm at the steering position to indicate when it is running; and

(g) each submersible bilge pump is accessible for inspection, removal or maintenance without removal of permanent ship structure; and

(h) electrically driven submersible bilge pumps rated for 12V, 24V or 32V DC comply with the International Standard *ISO 8849:1990 Small Craft – Electrically operated bilge pumps* or an equivalent standard;¹⁵ and

(i) there are two sources of electrical supply on the ship that are capable of running the pumps in any one compartment for 12 hours; and

(j) subject to rule 40C.24(3), on a ship of 12 metres or more in overall length, emergency bilge pumping arrangements are provided for compartments outside the main machinery space that are fitted with only one submersible bilge pump.

(3) The requirement in rule 40C.24(2)(j) may be met by a portable submersible self-priming pump, if the pump—

(a) is of a capacity equal to or more than that required for the fixed submersible pumps; and

(b) is stored, with its suction and discharge hoses, in a locker marked for emergency use only; and

(c) is for immediate use; and

(d) if an emergency switchboard is required by rule 40C.39(2), has power supplied from that switchboard.

(4) Subject to subrule (5), a pre-27 May 2004 ship must comply with rules 40C.24(1) or (2), as applicable, as if it were a post-27 May 2004 ship.

(5) A pre-27 May 2004 ship that was surveyed and issued with—

(a) a certificate of survey under section 219 of the Shipping and Seamen Act 1952 or section 143 of the Maritime Transport Act 1994; or

(b) a safe ship management certificate, issued prior to the date of coming into force of this Part;

is not required to comply with rules 40C.24(1) or (2), provided that, since the issue of the applicable certificate,

(c) the ship has not undergone major alteration; and

(d) the ship's operating limits have not been changed to permit the ship to proceed beyond the limits previously assigned.

¹⁴ To prevent pollution, a submersible pump in the machinery space should not be fitted with a float switch.

¹⁵ Equivalent standards are European Standard EN 28849:1993 and British Standard BS EN 28849:1993

40C.25 Bilge piping

- (1) (a) Bilge piping arrangements must be arranged so as to prevent water passing from the sea into holds or machinery spaces, or from one watertight compartment to another.
 - (b) The bilge connection to any pump that also draws from the sea or from water ballast spaces must be either—
 - (i) a screw down non-return valve; or
 - (ii) a cock that cannot be opened at the same time to the bilges and to the sea or to the bilges and the water-ballast spaces.
 - (c) Bilge suction pipes must be either—
 - (i) located at least 20 percent of the breadth of the ship inboard of the ship's sides to avoid damage in the event of a collision; or
 - (ii) provided with non-return valves or foot valves fitted within the space they serve.
 - (d) All manually operated valves must be readily accessible under normal circumstances.
- (2) (a) Piping used in bilge systems must be of marine quality metal, except that—
 - (i) non-metallic bilge piping may be used on ships of less than 12 metres in length overall that do not proceed beyond restricted limits or on ships of less than 15 metres in length overall that do not proceed beyond enclosed waters; and
 - (ii) non-metallic bilge piping may be used in association with submersible bilge pumps that comply with rule 40C.24(2); and
 - (iii) non-metallic bilge piping may be used in non-metallic hulled ships, if the pipe material and arrangements are to the satisfaction of a surveyor.
- (b) Where non-metallic bilge piping is used, it must have a high resistance to salt water, fuel oil, heat and vibration and be capable of operating under suction without collapse and resultant reduction of its effective area.
- (3) For ships of 10 metres or more in length overall, the diameter of bilge suction pipes must be the greater of the following—
 - (a) not less than—
 - (i) $d_m = 25 + 1.68 \sqrt{L(B + D)}$
 - (ii) $d_b = 25 + 2.16 \sqrt{C(B + D)}$

where

d_m = internal diameter of the main bilge suction in mm
 d_b = internal diameter of branch bilge suction pipes in mm
 L = ship length overall in metres
 B = breadth of single hull ship or breadth of hull in multi-hull ship, in metres
 D = depth of ship in metres
 C = length of compartment in metres; or

(b) 32 mm.

- (4) For ships of less than 10 metres in length overall, the internal diameter of bilge suction pipes must be not less than 25 mm.
- (5) In post-27 May 2004 ships of 15 metres or more in length overall that proceed beyond restricted limits and in which a bilge main is fitted, at least two bilge suctions must be fitted in the machinery space. One suction must be connected to the bilge main and the other must be a direct bilge suction.

- (6) (a) On a ship of 20 metres in length overall or more, each bilge suction in a machinery space must be fitted with a mudbox and metallic tail pipe.
(b) A bilge suction in a space other than a machinery space must be fitted with a mudbox, strum box or strainer, as appropriate, except that where a direct bilge suction pump capable of pumping solids and waste is fitted, a surveyor may permit the omission of a strum box or strainer.
(c) If a strum box or strainer is fitted, the strum box or strainer holes must be no greater than 10 mm in diameter and the aggregate area of the holes must be no less than twice the area of the suction pipe.
- (7) Where a ship is fitted with submersible bilge pumps in accordance with rule 40C.24(2), discharge piping arrangements must include at least two automatic non-return devices that are fitted between the overboard discharge and compartment being served by the pump. One of these devices must be an automatic non-return valve situated at or near the ship's side and the other must be either—
 - (a) an automatic non-return valve; or
 - (b) a pipework loop taken up to the highest practicable point below the weathertight deck.

40C.26

Bilge alarm

In a ship other than an open or partially decked ship, a space in which the main propulsion machinery is located that contains through hull fittings must be fitted with either—

- (a) a bilge level device that is connected to an audible alarm located near the steering position. The power supply for the audible alarm must be available at all times when there is any person on board; or
- (b) an automatic submersible bilge pump that complies with rule 40C.24(2) and has located at the steering position a means of indicating that it is running.

40C.27

Sounding arrangements

- (1) In a ship of 24 metres in length overall or more, all tanks forming part of the structure of the ship and all watertight compartments other than the machinery space must be provided with efficient sounding arrangements.
- (2) Where sounding pipes are used for this purpose, all such pipes must extend above the bulkhead deck and a doubling pad must be placed below the sounding pipe for the sounding rod to strike upon.
- (3) Where sounding pipes from the bilges, double bottom tanks or cofferdams terminate within the propulsion machinery space, they must be fitted with a closing cock.

Machinery

40C.28

General

- (1) A ship with a propulsion motor of more than 5 kW shaft power must have sufficient astern power to provide for manoeuvrability of the ship under all normal operating conditions.
- (2) Main and auxiliary machinery essential for the propulsion and safety of the ship must be provided with effective means of control and such readily visible instrumentation as a surveyor considers is appropriate for the safe operation of such machinery on that ship.
- (3) A post-27 May 2004 ship fitted with an inboard engine must be provided with sufficient fuel tankage for its intended service and area of operation.
- (4) The machinery, fuel tank or tanks, and associated piping systems and fittings, must be—

- (a) of a design and construction adequate for the service for which they are intended; and
- (b) so installed and protected as to reduce to a minimum the danger to persons from moving parts, hot surfaces and other hazards during normal movement about the ship.
- (5) Machinery spaces must be adequately ventilated and so designed as to provide safe and free access to all machinery and machinery controls, including any parts that may require servicing at sea and while in operation.
- (6) Two means of escape must be provided from a machinery space of Category A, except that a surveyor may permit a single means of escape that does not lead to other areas of major fire hazard if the space is an unmanned machinery space not exceeding 5 metres in length.

40C.29 Petrol inboard and outboard engines

- (1) A ship may be fitted with an inboard petrol engine if—
 - (a) the engine is located in an enclosed space to which a fixed fire extinguishing system is fitted; and
 - (b) provision is made to ventilate the engine space thoroughly before the engine is started;¹⁶ and
 - (c) electrical devices within the engine and tank compartments have protection against ignition of surrounding flammable gases;¹⁷ and
 - (d) any flexible hose used between the engine and any solidly mounted metallic line to eliminate vibration failure is made of fire resistant fuel hose;¹⁸ and
 - (e) not more than 12 persons (including crew) are carried; and
 - (f) the ship does not proceed beyond inshore operating limits.
- (2) A ship fitted with one or more outboard petrol engines—
 - (a) must not proceed beyond restricted coastal limits; and
 - (b) must have the engines securely fastened to the hull; and
 - (c) if the engines are not permanently secured, must provide the engines with an effective safety chain or cable; and
 - (d) must have effectively drained engine wells that are long enough for the engine to be tilted up.
- (3) Petrol for any outboard engine must be stored—
 - (a) in portable containers;¹⁹ or
 - (b) in a fixed-in-place inboard tank, if—
 - (i) the ship is a rigid hulled ship or rigid/inflatable boat; and
 - (ii) the tank is constructed of steel, stainless steel or aluminium alloy and located in a safe place; and
 - (iii) the tank is tested to a pressure of 0.3 bar, to a surveyor's satisfaction; and
 - (iv) the opening of the vent pipe from the petrol tank is protected by a flash proof fitting; and

¹⁶ For guidance, it is recommended that reference be made to ISO 11105: –*Small Craft – Ventilation of petrol engine and/or petrol tank compartments*.

¹⁷ For guidance, it is recommended that reference be made to ISO 8846: – *Small Craft – Electrical devices – Protection against ignition of surrounding flammable gases*.

¹⁸ For guidance, it is recommended that reference be made to ISO 7840: – *Small Craft – Fire resistant fuel hoses*.

¹⁹ For guidance, it is recommended that reference be made to ISO 13591 *Small craft - Portable fuel systems for outboard motors*.

where the possibility of accumulation of hydrocarbon vapours exists and where a source of ignition may be present, a safe detector of hydrocarbon gas is fitted under or adjacent to the tank.

(3A) Aluminium tanks must only be used for “fixed-in-place” inboard fuel tanks.

(4) (a) Except as provided in rule 40C.29(4)(b), a post-27 May 2004 ship fitted with an outboard engine or engines must undergo a test in accordance with Appendix D of the Australian standard AS 1799.1 *Small Pleasure Boats Code Part 1: General requirements for power boats*, to confirm that the boat can manoeuvre safely using its maximum power capacity.

(b) If the prototype of any series production boat has completed the test referred to in rule 40C.29(4)(a) to the satisfaction of a surveyor, subsequent boats of that series may be accepted by a surveyor without undertaking that test.

40C.30 Fuel tanks

(1) All fuel tanks fitted on a ship must—

- be tested and installed to the satisfaction of a surveyor; and
- have a means of safely ascertaining the amount of fuel contained; and
- be provided with vents and filling connections located in a safe open-air position.

(2) A ship must be provided with a means of isolating a source of fuel that may feed a fire in a machinery space. In a ship of 24 metres or more in length, a valve or cock that is capable of being closed from a position outside the machinery space must be fitted in the fuel feed pipe as close as possible to the fuel tank.

40C.31 Portable plant

(1) If portable plant powered by a petrol engine is provided, the plant must be stored on an open weather deck.

(2) Any deck locker or protective enclosure provided for petrol engine powered portable plant—

- must not have openings to an enclosed space within the hull of the ship; and
- must be adequately ventilated and drained.

(3) Petrol tanks provided for the plant must comply with rule 40C.29(3).

(4) Gas welding and cutting equipment, if carried, must be—

- stowed in a secure manner on an open deck at a safe distance away from any potential source of fire; and
- able to be readily jettisoned overboard, if necessary.

40C.32 Inlets, discharges and sea water piping

(1) Openings below the weather deck of ships less than 24 metres in length overall must be provided with—

- an efficient means of closure fitted as close as possible to the side of the ship; and
- if the opening is for the purpose of an inlet or discharge below the waterline, it must be fitted with a seacock or valve that is readily accessible in an emergency.²⁰

(2) Inlet and discharge pipes from water closets must be provided with ship side fittings in accordance with rule 40C.32(1). When the rim of a toilet is either below or less than 300 mm above the deepest waterline of the ship, anti-siphon measures must be provided.

²⁰ Openings in ships of 24 metres or more in length overall that are load line ships are governed by Part 47.

- (3) An opening for a log or other sensor that is capable of being withdrawn must be fitted watertight to a surveyor's satisfaction and provided with an effective means of closure when the fitting is removed.
- (4) Engine exhaust outlets that penetrate the hull below the deck must be provided with the means to prevent backflooding into the hull through the exhaust system.
- (5) Fittings attached to the shell and the seacock or valve required by rule 40C.32(1) must be of steel, bronze, or other ductile material acceptable to a surveyor.
- (6) Other than bilge piping to which rule 40C.25(2)(a)(i) and (ii) applies, all pipes that carry seawater must be of marine quality metal, except that—
 - (a) in a ship of less than 24 metres in length overall that is constructed of nonmetallic materials, non-metallic piping may be used; and
 - (b) suitable reinforced synthetic rubber piping may be used in short lengths for vibration damping.
- (7) Where non-metallic piping or reinforced synthetic piping is used, it must—
 - (a) have a high resistance to salt water, fuel oil, heat and vibration; and
 - (b) be capable of operating under suction without collapse and resultant reduction in effective area; and
 - (c) for non-metallic piping, have resistance to impact damage; and
 - (d) for reinforced synthetic rubber piping, be readily visible and protected against mechanical damage and contact with hot surfaces.

40C.33 Steering gear

- (1) A ship must be provided with an efficient means of steering that is of adequate strength and sufficient to steer the ship at full speed ahead and astern.
- (2) When a steering gear is fitted with a remote control, other arrangements must be provided to effectively steer the ship in the event of failure of the remote control.²¹ Emergency steering need not be provided in a twin screw ship if a surveyor is satisfied that the ship can manoeuvre adequately on both engines.

Electrical

40C.34 General

A ship's electrical system must—

- (a) be permanently installed; and
- (b) be such as to minimise risk of fire; and
- (c) not be hazardous to passengers and crew; and
- (d) be convenient to operate; and
- (e) provide a high degree of reliability.

40C.35 Design

- (1) The owner of a ship to which rule 40C.7(1) applies which is a post-27 May 2004 ship or a ship that undergoes major alteration of its electrical systems must ensure that the information set out in subrule (2) is provided in a clear and legible form to and approved by a surveyor recognised by the Director for that purpose before the ship is built, or the electrical systems are altered or modified, as the case may be.
- (2) The diagrams and information required by subrule (1) are—
 - (a) schematic diagrams of the main and any emergency power and lighting systems which include—

²¹ The emergency steering may be by means of a tiller to fit the head of the rudder stock.

- (i) a description of the type of electrical systems of supply installed; and
- (ii) ratings of generators, transformers, batteries, charging sources, inverters, semi-conductor converters; and
- (iii) all feeders connected to each switchboard; and
- (iv) insulation type, size, and current loadings of feeder and final sub-circuit cables; and
- (v) make, protection characteristic curve, prospective short circuit, and over current ratings of all circuit breakers and fuses; and
- (b) simplified diagrams of generation circuits, battery charging, interconnector circuits, and feeder circuits; and
- (c) arrangement and location plans of main and emergency switchboards plus any distribution boards; and
- (d) plans showing the location of the main and emergency sources of power, radio battery, inverters, and battery chargers; and
- (e) electrical load calculations used to determine the capacities of main and emergency generators and battery banks; and
- (f) circuit diagram(s) of electrically powered bilge pumps plus bilge level alarms and pump monitoring systems; and
- (g) circuit diagrams of electrically powered navigation lights, controls, and monitoring; and
- (h) volt drop calculations of each of the following:
 - (i) main power feeder circuit; and
 - (ii) navigation light circuit; and
 - (iii) bilge pump circuit; and
 - (iv) vhf radio power supply circuit.

40C.36 Installation and materials

- (1) The builder of a ship must ensure that any installation of electrical wiring and equipment is carried out by suitably qualified person or persons who are experienced in marine electrical work.
- (2) Electrical equipment, switchboards and conductors must be so selected and located that they are unaffected by water, oil, heat or other environmental conditions to which they may be exposed in a ship.

40C.37 Electrical systems

- (1) For ships of 24 metres or less in length overall, the electrical systems must comply with either—
 - (a) the relevant rules of a classification society named in rule 40C.9(2)(a); or
 - (b) the applicable parts of the AS/NZS 3004.2 *Electrical installations – Marinas and Boats*.
- (2) For ships of more than 24 metres in length overall, the electrical systems must comply with either:
 - (a) the relevant rules of a classification society named in rule 40C.9(2)(a); or
 - (b) the applicable parts of the IEC 60092 series of standards – *Electrical installations in ships*.

40C.38 Marking and documentation

- (1) The owner and master of a ship of more than 12 metres in length must ensure a manual containing the information set out in subrules (2) and (3) is kept on board the ship and readily accessible at all times.”
- (2) The manual must include the following information:

- (a) diagrams identifying the electrical circuits of the ship with the locations of electrical devices in the ship and identification of conductors by colour or other means; and
- (b) the location and a description of the functions of electrical controls, dials, switches, fuses, and circuit-breakers installed on the panel-board; and
- (c) instructions for operating and maintaining the electrical system.

(3) The manual must include the following warning instructions:

- (a) never work on the electrical installation while the electrical system is energized; and
- (b) never modify the craft's electrical systems or relevant drawings; and
- (c) never use the electrical system if the shore power reverse polarity indicator is activated; and
- (d) never alter or modify the rated current amperage of overcurrent protective devices; and
- (e) never install or replace electrical appliances or devices with components exceeding the rated current amperage of the circuit; and
- (f) never leave the craft unattended with the electrical system energized except battery chargers, automatic bilge-pumps, fire protection and alarm circuits.

(4) The owner of a post-27 May 2004 ship must maintain copies of the drawings and manuals required by this rule on board the ship.

(5) The owner of a pre-27 May 2004 ship must maintain on board the ship documentation that the surveyor considers sufficient to enable the ship to be safely operated and maintained.

40C.39 Emergency lighting

- (1) If general lighting within a post-27 May 2004 ship of 12 metres or more in length overall is provided by a centralised electrical system, an alternative source of power must be installed to provide emergency lighting for a period of at least 3 hours in passenger spaces below the weather deck. The emergency lighting must be sufficient to enable persons to make their way to the open deck.
- (2) In a ship that proceeds beyond a restricted coastal limit, an alternative source of power for emergency lighting must be provided—
 - (a) that is sufficient to enable persons to make their way to the open deck and evacuate the ship if necessary; and
 - (b) that is sufficient to illuminate, for at least 6 hours—
 - (i) any launching gear for lifeboats or liferaft launching appliances and the lifeboats and liferafts that they serve; and
 - (ii) the water into which the lifeboats and any liferafts served by launching appliances are launched; and
 - (iii) the stowage position of liferafts for which launching appliances are not provided.
- (3) In a ship of 12 metres or more in length overall, an alternative source of power must be available to power navigation lights in accordance with the requirements of Part 22 of the maritime rules.
- (4) An alternative source of power required by this rule must be—
 - (a) self contained; and
 - (b) located in a compartment other than that containing the main source of power; and
 - (c) either a generator or an accumulator battery.

40C.40 Navigation lights

- (1) Each navigation light may be on the same switch but must be individually protected in each non-earthing pole by a fuse or circuit breaker that must be mounted on one clearly marked section of a distribution switchboard.
 - (1A) The distribution switchboard referred to in subrule (1) must be accessible to the person on watch on a ship of more than 12 metres in length overall.
- (2) On post-27 May 2004 ships of 24 metres or more in length overall which proceed beyond restricted limits, each navigation light must be provided with an automatic indicator giving audible or visual indication of failure of the light.
- (3) Cables supplying navigation lights must be of sufficient size to ensure that total circuit volt drop does not exceed 3 percent of the supply system voltage.

40C.41 Lightning protection²²

- (1) If fitted, lightning conductors must comply with the requirements of rules 40C.41(2) and 40C.41(3).
- (2) In wood and composite ships fitted with wooden masts, lightning conductors must comply with the following:
 - (a) they must be of continuous copper tape or rope, or a combination of copper tape and rope, having a cross sectional area not less than 100 mm², which must be riveted with copper rivets or fastened with copper clamps to a suitable copper spike that is not less than 13 mm in diameter and that projects at least 150 mm above the top of the mast; and
 - (b) where tape is used, the lower end of the tape must terminate at the point at which the shrouds leave the mast, and must be securely clamped to a copper rope of not less than 13 mm diameter. This copper rope must be led down the shrouds and must be securely clamped to a copper earth plate not less than 0.2 m² in area, fixed well below the light waterline and attached to the ship's hull in such a manner that it is immersed under all normal conditions of heel.
- (3) In wood and composite ships fitted with steel masts, each mast must be connected to a copper plate in accordance with the requirements of subrule (2) The copper rope must be securely attached to, and in good electrical contact with, the mast at or above the point at which the shrouds leave the mast.
- (4) In steel ships fitted with wooden masts, the lightning conductors must be of copper tape or rope terminating in a spike, as required by rule 40C.41(2). At the lower end of the mast, the copper tape or rope must be securely clamped to the nearest metal forming part of the hull of the ship.
- (5) Lightning conductors must be run as straight as possible, and sharp bends in the conductors must be avoided. All clamps used must be of brass or copper and securely locked. No connection may be a soldered connection.
- (6) The resistance of the lightning conductor, measured between the mast head and the position on the earth plate or hull to which the lightning conductor is earthed, must not exceed 0.02 ohms.
- (7) Lightning conductors must be positioned so as to minimise the risk of side strike.

²² For hulls and masts of materials other than those referred to in these rules the arrangements need individual and specialist consideration. The use of copper with an aluminium alloy hull will present corrosion problems.

40C.42 Tests and trials

- (1) Before a new electrical system or an electrical system that has undergone major alteration or modification is put into service, the electrical system must be inspected and tested to the satisfaction of a surveyor.
- (2) The inspection and tests must include—
 - (a) visual inspection; and
 - (b) inspection for continuity of all conductors; and
 - (c) insulation resistance tests; and
 - (d) verification of polarity; and
 - (e) confirmation of earthing; and
 - (f) confirmation that it is not possible to make contact with bare live parts; and
 - (g) confirmation that alarms and shutdown devices are functional.
- (3) The insulation resistance of all circuits and equipment must be—
 - (a) measured, using a direct current insulation tester, between—
 - (i) all current carrying parts connected together and earth; and
 - (ii) all current carrying parts of opposite polarity or phase; and
 - (b) not less than 1 megohm.

If initial tests produce results less than 1 megohm, appliances may be disconnected and tested separately. Disconnected appliances must have an insulation resistance of not less than 0.5 megohm.

Structural fire protection

40C.43 Definitions

The following definitions apply to rules 40C.44 to 40C.50 inclusive:

accommodation spaces means those spaces used for lounges, mess rooms, recreational rooms, lavatories, cabins, offices, hospitals, pantries containing no cooking appliances, and similar spaces:

areas of major fire hazard means machinery spaces of Category A, spaces containing dangerous goods, store rooms containing flammable products and spaces containing road vehicles:

areas of moderate fire hazard means auxiliary machinery spaces and separate galleys:

areas of minor fire hazard means accommodation and cargo spaces:

control stations are those spaces in which the ship's radio or main navigation equipment or the emergency source of power is located, or where the fire recording or fire control equipment is centralised:

corridors means passenger and crew corridors and lobbies:

evacuation stations means deck spaces forming survival craft embarkation stations and muster stations:

fire-resisting divisions means those divisions formed by bulkheads and decks that are constructed of non-combustible or fire-restricting materials and that by insulation or inherent fire-resisting properties satisfy the requirements and criteria of the *Test Procedures for Fire-Resisting Divisions of High Speed Craft* adopted by the International Maritime Organization by resolution MSC.45(65):

fire-restricting material means material that has properties that comply with the criteria for qualifying products as 'fire-restricting materials' in the *Standard for Qualifying Marine Materials for High Speed Craft as Fire-Restricting Materials* adopted by the International Maritime Organization by resolution MSC.40(64):

low flame spread surface means that the surface thus described will adequately restrict the spread of flame, this being determined—

- (a) in accordance with the test procedure specified in the *International Code for Application of Fire Test Procedures* adopted by the International Maritime Organization by resolution MSC.61(67); or
- (b) from evidence of approval as a low flame spread material by the Administration of another state or a classification society, where tests have been carried out in accordance with the *Recommendation on Improved Fire Test Procedures for Surface Flammability of Bulkhead, Ceiling and Deck Finish Materials*, adopted by the International Maritime Organization by resolution A.653(16); or
- (c) in accordance with the test procedure in the standard AS/NZS 1530.3 :1999 *Methods for fire tests on building materials, components and structures Part 3: Simultaneous determination of ignitability, flame propagation, heat release and smoke release*, where the material must meet the following criteria:
 - (i) the spread of flame index is not to exceed 3; and
 - (ii) the ignitability index plus heat evolved index is not to exceed 7 (in total); and
 - (iii) the smoke developed index is not to exceed 4, unless the spread of flame index does not exceed 1, and the ignitability index plus the heat evolved index does not exceed 3, in which case the Director may accept a smoke developed index of up to 5:

machinery spaces means those machinery spaces of Category A:

non-combustible material means material that neither burns nor gives off flammable vapours in sufficient quantity for self-ignition when heated to approximately 750° C, this being determined by the test procedure laid down in the *Improved Recommendation on Test Method for Qualifying Marine Construction Materials as non-combustible* adopted by the International Maritime Organization by resolution A.472(XII):

service spaces are those spaces used as galleys, pantries containing cooking appliances, store rooms and workshops other than those forming part of a machinery space:

smoke-tight means that a division made of non-combustible or fire-restricting materials is capable of preventing the passage of smoke.

40C.44 Post-27 May 2004 ships of 24 metres or more that proceed beyond the coastal limit and ships of less than 500 gross tonnage that proceed on an international voyage

For post-27 May 2004 ships of 24 metres or more in length overall that proceed beyond the coastal limit, or post-27 May 2004 ships of less than 500 gross tonnage that proceed on an international voyage, the structural fire-resisting divisions separating spaces from adjacent spaces must be in accordance with Table 40C.5 and the accompanying notes.

Table 40C.5

Structural Fire Protection Times for Fire-resisting Divisions (Bulkheads and Decks) Separating Spaces of Varying Fire Hazard

Space		1	2	3	4	5
Area of major fire risk	1	60 ¹ 60 ¹	30 60	C/FRM 60	C/FRM 60	C/FRM 60
Area of moderate fire risk	2		² ²	C/FRM ²	C/FRM 30	C/FRM ²
Area of minor fire risk	3			C/FRM C/FRM	C/FRM 15	C/FRM C/FRM
Control station	4				C/FRM C/FRM	C/FRM C/FRM
Evacuation/escape routes	5					C/FRM C/FRM

Notes for Table 40C.5

The values top and bottom represent the required structural fire protection time in minutes for the protection system on the relevant side of the division.

¹ Where adjacent spaces are in the same numerical category, a bulkhead or deck need not be required between such spaces, for example, two storerooms containing flammable products. However a bulkhead is required between a galley and a storeroom containing flammable products, even though both spaces are in the same category.

² The fire protection time is 0 minutes and the time for prevention of passage of smoke and flame is 30 minutes as determined by the first 30 minutes of the standard fire test.

C/FRM means there is no structural fire protection requirement but smoke-tight non-combustible or fire-restricting material is required.

40C.45

Post-27 May 2004 ships of 24 metres or more that do not proceed beyond the coastal limit

For post-27 May 2004 ships of 24 metres or more in length overall that do not proceed beyond the coastal limit—

- (a) the decks and bulkheads separating any area of major fire hazard from control stations, evacuation routes and survival craft embarkation areas must have a fire protection time of 30 minutes; and
- (b) the decks and bulkheads separating any area of major fire hazard from accommodation spaces must have a fire protection time of 15 minutes; and
- (c) the decks and bulkheads separating any area of moderate fire hazard from control stations, evacuation routes and survival craft embarkation areas must have a fire protection time of 15 minutes; and
- (d) as an alternative to the fitting of structural fire protection required in rules 40C.45(a), (b) and (c), the following may be installed:
 - (i) boundary cooling of decks and bulkheads by fixed or portable means where the bulkhead or deck is of metal construction and the bulkhead or deck is sufficiently exposed to enable cooling; or
 - (ii) where a fixed fire extinguishing system that complies with Appendix 2 is fitted in the fire hazard area,—
 - (aa) a second shot for a gaseous fixed fire extinguishing system; or
 - (bb) arrangements to enable continuous operation of a water-mist fixed fire extinguishing system.

40C.46 Maintenance of structural integrity

- (1) In ships to which rules 40C.44 and 40C.45 apply, the main load-carrying structures within areas of major fire hazard and areas of moderate fire hazard must be arranged to distribute load so as to ensure that there will be no collapse of the construction of the hull and superstructure when it is exposed to fire for the applicable fire protection time.
- (2) If the structures specified in rule 40C.46(1) are made of aluminium alloy, their insulation must be such that the temperature of the core does not rise more than 200° C above the ambient temperature within the applicable times specified in Table 40C.5.
- (3) If the structures specified in rule 40C.46(1) are made of combustible material, their insulation must be such that their temperatures will not rise to a level where deterioration of the construction will occur during exposure to the fire test specified for load bearing fire-resisting divisions in *Test Procedures for Fire-Resisting Divisions of High Speed Craft* adopted by the International Maritime Organization by resolution MSC.45(65).

40C.47 Pre-27 May 2004 ships

Revoked on 4 September 2008 by Maritime (Various Amendments) Rules 2008

40C.48 General requirements

The following requirements apply to all ships:

- (a) doors and other closures of openings within the bulkheads forming fire-resisting divisions must be, as far as is practicable, of the same fire-resisting standard as the division in which they are fitted, except that watertight doors of steel need not be insulated. Doors to machinery spaces of Category A must be self-closing;
- (b) the fire integrity of bulkheads or decks forming fire-resisting divisions must not be impaired if they are penetrated for the passage of electrical cables, pipes, ducts and similar products. Arrangements must be made to ensure that the fire integrity of the division is not impaired;
- (c) where two fire divisions having different structural fire protection times intersect, the insulation of the division with the higher structural fire protection time must continue on the deck or bulkhead with the insulation of the lesser structural fire protection time for a distance of at least 450mm;
- (d) combustible veneers are permitted on non-combustible divisions and fire-resisting divisions, if they are low flame spread surfaces;
- (e) glass or similar materials must not be fitted in machinery space boundaries of post-27 May 2004 ships;
- (f) thermal or acoustic insulation fitted in accommodation spaces, service spaces (except domestic refrigeration spaces), control stations and machinery spaces, must, if the insulation is not a fire-resisting division or a fire-restricting material, be non-combustible and must not be capable of producing quantities of smoke and toxic gases. The surface of insulation fitted on the internal boundaries of machinery spaces of Category A must be impervious to oil;
- (g) paints, varnishes or other finishes used on exposed interior surfaces must provide low flame spread surfaces and must not be capable of producing quantities of smoke or toxic gases;
- (h) primary deck coverings within accommodation spaces, service spaces and control stations must be of material approved by a surveyor that will not readily ignite or give rise to toxic or explosive hazards at elevated temperatures;
- (i) all exposed surfaces of fibre reinforced plastic construction within accommodation and service spaces, control stations, machinery spaces of Category A and other machinery spaces of similar fire risk must have a final lay-up layer of resin—
 - (i) with inherent fire-retardant properties; or
 - (ii) that is coated with a fire-retardant paint; or

- (iii) that is protected by non-combustible materials;
- (j) all waste receptacles must be constructed of non-combustible materials with no openings in the sides or bottom;
- (k) in a ship of 24 metres or more in length overall, machinery driving fuel oil unit pumps and other similar fuel pumps must be fitted with remote controls situated outside the space in which it is located so that it can be stopped in the event of a fire arising in the space in which it is located;
- (l) drip trays must be fitted where necessary to prevent leakage into bilges;
- (m) all main and auxiliary machinery exhaust pipes must be kept clear of, or well insulated in way of, any timber or other combustible material;
- (n) materials readily rendered ineffective by heat must not be used for overboard scuppers, sanitary discharges and other outlets that are close to the waterline, where failure of the material in the event of fire would give rise to danger of flooding;
- (o) in accommodation and service spaces and control stations, pipes penetrating fire-resisting divisions must be of a material acceptable to a surveyor, having regard to the temperature that such divisions are required to withstand;
- (p) survival craft must be protected from major fire hazards. Where a ship has survival craft stowed directly above an area of major fire hazard, the deck in that vicinity must have a structural fire protection time of at least 15 minutes.

40C.49

Heating and cooking installations

The following requirements apply to all ships:

- (a) electric radiators must be fixed in position and so constructed as to reduce fire risks to a minimum;
- (b) open flame appliances, except cooking stoves, domestic refrigerators and water heaters, are not permitted. Spaces containing any such stoves or water heaters must have adequate ventilation to remove fumes and possible gas leakage to a safe space. All pipes conveying gas from a container to a stove or water heater must be of steel or other material approved by a surveyor. Automatic safety gas shut-off devices must be fitted to operate on loss of pressure in the gas main pipe or flame failure on any appliance;
- (c) cooking appliances must be installed to reduce the risks of fire caused by heat radiating from the cooking element or flame or from cooking fats and oils catching alight. The bulkheads and linings in way of, and decks and ceilings above, the cooking appliance must be of non-combustible or fire-restricting materials;
- (d) cylinders for compressed, liquefied or dissolved gases must—
 - (i) be clearly marked by means of identifying colours;²³ and
 - (ii) have a clearly legible identification of the name and chemical formula of their contents; and
 - (iii) be properly secured;
- (e) cylinders containing flammable or other dangerous gases and expended cylinders must be—
 - (i) stored and properly secured on open decks and all valves, pressure regulators and pipes leading from such cylinders must be protected against damage; and
 - (ii) protected against excessive variations in temperature, direct rays of the sun and accumulation of snow. A surveyor may permit cylinders to be stored in a compartment or compartments that comply with rules 40D.56(3) to 40D.56(5) inclusive.

²³ Refer to the standard found in NZS 5807:1980 *Code of Practice for Industrial Identification by Colour, Wording or Other Coding*.

40C.50 Ventilation systems

The following requirements apply to all ships:

- (a) means must be provided to stop fans and close main openings to ventilation systems from outside the space served;
- (b) ventilation systems serving machinery spaces of Category A must be independent of ventilation systems serving other spaces;
- (c) ventilation ducts serving more than one space or passing through one space to serve another must be of non-combustible material;
- (d) ventilation ducts for machinery spaces of Category A must not pass through accommodation spaces, service spaces or control stations unless the ducts are constructed of steel or an equivalent material and arranged to protect the integrity of any fire-resisting divisions. Conversely, any ventilation ducts for accommodation spaces, service spaces or control rooms must not pass through machinery spaces of Category A unless the ducts are constructed of steel or an equivalent material and arranged to protect the integrity of any fire-resisting division;
- (e) store rooms containing flammable products must be provided with ventilation systems that are independent of ventilation systems serving other spaces;
- (f) (i) except as provided in 40C.50(g), in a ship of 24 metres or more in length overall, ventilation ducts with a cross-section of 0.075 m^2 or more must, where they pass through a fire-resisting division, be fitted with a 900 mm steel sleeve and fire dampers; and
 - (ii) a fire damper must—
 - (aa) operate automatically and be capable of being closed manually from either side of the bulkhead; and
 - (bb) have an indicator to show if it is open or closed;
- (g) fire dampers are not required where a duct—
 - (i) passes through a space surrounded by fire-resisting division; and
 - (ii) does not serve that space; and
 - (iii) has the same fire integrity as the divisions through which it passes.

Fire fighting appliances

40C.51 Fire fighting appliances

- (1) The owner and the master of a ship must ensure that fire appliances are provided in accordance with the requirements of Appendix 2 of this Part.
- (2) The owner and the master of a ship must ensure that the fire appliances meet the performance standards given in Part 42B.
- (3) The owner and the master of a ship must ensure that the fire appliances are maintained, inspected and serviced in accordance with the requirements of Part 42B.
- (4) The master of a ship must ensure that all fire appliances are in working order and ready for immediate use before the ship commences a voyage and at all times during the voyage.

Life saving appliances

40C.52 Life saving appliances

- (1) Subject to rule 40C.52(5), the owner and the master of a ship must ensure that life saving appliances are provided in accordance with the requirements of Appendix 3 of this Part.
- (2) The owner and the master of a ship must ensure that the life saving appliances meet the performance standards prescribed in Part 42A.

- (3) The owner and the master of a ship must ensure that the life saving appliances are maintained, inspected and serviced in accordance with the requirements of Part 42A.
- (4) The master of a ship must ensure that all life saving appliances are—
 - (a) in good working order; and
 - (b) ready for immediate use;before the ship commences a voyage and at all times during the voyage.
- (5) The owner and master of a pre-27 May 2004 ship are not required to meet the requirements of Appendix 3 until 1 February 2003, if the ship continues to carry the life saving appliances that were required by the Shipping (Lifesaving Appliances) Regulations 1989 on the day before this Part entered into force.

Radiocommunications

40C.53 Radiocommunication equipment

- (1) The owner and the master of a ship that proceeds beyond enclosed waters must ensure that radiocommunication equipment is provided in accordance with the requirements of Appendix 4 of this Part.
- (2) Except as provided in rule 40C.53(6), the owner and master of a ship that operate only within enclosed waters must ensure that the ship is provided with at least two means of distress alert that may be either—
 - (a) a VHF radio that complies with rule 43.12; or
 - (b) a 406 MHz EPIRB that complies with the requirements of rule 43.18A or 43.19; or
 - (c) if there is no VHF coverage for the applicable operating area, a cell phone, if—
 - (i) there is cell phone coverage for the full area of the ship's operation; and
 - (ii) where this means of distress alert is permitted, a permanent notice is displayed in a prominent position to the effect that the emergency number 111 must be used as the recognition number for a distress call; or
 - (d) (i) if the ship is greater than 6 metres in length overall, or of 6 metres in length overall or less and operating in the hours of darkness (between sunset and sunrise), 2 buoyant smoke floats and 2 hand flares that comply with rules 42A.24 and 42A.23 respectively; and
 - (ii) if the ship is 6 metres or less in length overall and operates only in daylight, 2 buoyant smoke floats that comply with rule 42A.24.
- (3) The owner and master of a ship must ensure that the radiocommunication equipment meets the performance standards prescribed in Part 43.
- (4) The owner and the master of a ship must ensure that the radiocommunication equipment is maintained, inspected and serviced in accordance with the requirements of Part 43.
- (5) The master of a ship must ensure that all radiocommunication equipment is—
 - (a) in working order; and
 - (b) ready for immediate use;before the ship commences a voyage and at all times during any voyage.
- (6) A surveyor may exempt any boat operating in rivers and other similar restricted waterways within enclosed waters from any of the requirements of this rule, if a surveyor does not consider the requirement to be necessary for the safety of the ship.
- (7) The owner and the master of a ship must ensure that the radiocommunication equipment is fitted with a rechargeable battery that is available at all times the ship is at

sea and is of sufficient capacity to supply current continuously for a period of at least 6 hours.

Anchors and cables

40C.54 Post-27 May 2004 ships of 24 metres or more

The owner of a ship of 24 metres or more in length must ensure that the ship is provided with anchors and cables that comply with the requirements of—

- (a) a classification society listed in rule 40C.9(2)(a); or
- (b) Table 1 in Appendix 6.

The equipment numeral to be used with Table 1 in Appendix 6 is:

$$\text{For monohulls } \text{EN} = \Delta^{2/3} + 2(\text{Ba} + \sum \text{b.h}) + 0.1\text{A}$$

$$\text{For twin hulls } \text{EN} = \Delta^{2/3} + 2(\text{Ba} + \sum \text{b.h} + 2\text{G.B}_1) + 0.1\text{A}$$

where

EN = equipment numeral

Δ = moulded displacement, in tonnes, to the maximum design waterline.

B = maximum moulded breadth, in metres.

a = distance in metres from the maximum design waterline to the upper edge of the uppermost complete deck, at side amidships.

b = breadth of the widest superstructure or deckhouse on each tier, in metres.

h = height in metres of the centreline, of each tier of superstructure or deckhouse having a breadth greater than B/4. Sheer, camber and trim may be neglected in measuring h.

A = profile area in m^2 , of the hull above the maximum design waterline, and superstructures and deckhouses that have a breadth greater than B/4, within the overall length. Screens and bulwarks more than 1.5 metres in height must be regarded as parts of deckhouses when determining h and A.

B_1 = the greatest breadth of the hulls, in metres.

G = the minimum air gap between the maximum design waterline and the underside of the bridging structure between the hulls, in metres.

40C.55 Post-27 May 2004 ships of less than 24 metres

The owner of a post-27 May 2004 ship of less than 24 metres in length overall must ensure that the ship is provided with—

- (a) anchors and cables in accordance with the requirements of a classification society listed in rule 40C.9(2)(a); or
- (b) anchors in accordance with the requirements of Tables 2A, 2B or 2C of Appendix 6, and cables in accordance with Tables 3A or 3B and 4 of Appendix 6, and the notes accompanying Tables 3A and 3B and 4.

40C.56 Testing and marking

Anchors of more than 75 kgs weight, and chain cables of 12.5 mm diameter or more must comply with the testing and marking requirements contained in Part 41.

40C.57 Windlass

- (1) The owner and master of a post-27 May 2004 ship must ensure that—
 - (a) a powered windlass or other powered mechanical lifting device is provided, except for post-27 May 2004 ships using an anchor of less than 50kgs, in which case the windlass or mechanical lifting device may be hand operated; and

- (b) the windlass is of sufficient power ²⁴ and suitable for the size of chain attached to the anchor; and
- (c) the inboard end of the rope or chain is permanently made fast to the ship; and
- (d) windlasses or other mechanical lifting devices are securely fitted to the deck of the ship.

(2) Subrule (1)(a) does not apply to a post-27 May 2004 ship suing an anchor of less than 30kgs and using rope instead of anchor chain, in accordance with Tables 3A or 3B of Appendix 6 and the notes relating to Tables 3A or 3B.

40C.58 Pre-27 May 2004 ships

- (1) A pre-27 May 2004 ship that was issued with a certificate of survey is not required to comply with rules 40C.54 to 40C.57 inclusive, if the owner maintains its existing anchors and cables in a good condition that is satisfactory to a surveyor.
- (2) A pre-27 May 2004 ship that was not subject to survey under section 133 of the Maritime Transport Act 1994 is not required to comply with rules 40C.54 to 40C.57 inclusive, if the owner retains its existing anchors and cables and a surveyor is satisfied that those anchor and cable arrangements do not compromise the safety of the ship and its crew, and remain in a condition satisfactory to a surveyor.

Navigation position and equipment

40C.59 Navigation equipment

- (1) The navigating position on any ship must afford the person at the helm as wide an arc of visibility as possible, both ahead and abaft the beam, and where practicable, provide all round visibility.
- (2) The wheelhouse window forward of the helm position and those essential for the safe navigation of the ship must be clear.²⁵
- (3) Adequate space must be provided for the person at the helm that is not obstructed by passenger arrangements.

40C.59A Bridge Navigational Watch Alarm System

- (1) The owner of any of the following type of ship must ensure that the ship is fitted with a BNWAS:
 - (a) non-passenger ships of 150 gross tonnage or more engaged on international voyages to which Part 40B does not apply constructed on or after 1 January 2017:
 - (b) non-passenger ships of 150 tons gross tonnage or more engaged on international voyages to which Part 40B does not apply constructed before 1 January 2017 but on or after 1 July 2002, not later than the first survey on or after 1 January 2017:
 - (c) non-passenger ships of 150 gross tonnage or more engaged on international voyages to which Part 40B does not apply constructed before 1 July 2002 but on or after 25 May 1980, not later than the first survey on or after 1 January 2018:
 - (d) non-passenger ships of 500 gross tonnage or more not engaged on international voyages constructed on or after 1 January 2017:

²⁴ During trials a windlass should be capable of raising the anchor from a depth of 82.5 metres to a depth of 27.5 metres at a mean speed of 9 metres per minute. Where the depth of water is inadequate or the anchor cable is less than 82.5m, suitable equivalent simulating conditions may be accepted by the surveyor as an alternative.

²⁵ Other windows may be polarised or tinted.

- (e) non-passenger ships of 500 gross tonnage or more not engaged on international voyages constructed before 1 January 2017 but on or after 25 May 1980, not later than the first survey on or after 1 January 2017.
- (2) The owner of a ship to which subrule (1) applies must ensure that the BNWAS complies with IMO resolution MSC.128(75).
- (3) The master of a ship fitted with a BNWAS must ensure that the BNWAS is in operation at all times when the ship is underway.

40C.59B Long-Range Identification and Tracking System

- (1) The owner and master of a ship of 300 gross tonnage or more constructed before 1 January 2017 but on or after 25 May 1980 that proceeds on an international voyage must ensure that it is fitted with a system to automatically transmit long-range identification and tracking information in accordance with regulation 19-1 of Chapter V of SOLAS not later than the first survey of the radio installation on or after 1 January 2017.
- (2) The owner and master of a ship of 300 gross tonnage or more constructed after 1 January 2017 that proceeds on an international voyage must ensure that it is fitted with a system to automatically transmit long-range identification and tracking information in accordance with regulation 19-1 of Chapter V of SOLAS.

40C.59C Automatic Identification System

- (1) The owner and master of any of the following type of ship must ensure that an automatic identification system is fitted on board the ship in accordance with the requirements of regulation 19 of Chapter V of SOLAS:
 - (a) a ship of 300 gross tonnage or more constructed before 1 January 2017 but on or after 25 May 1980 that proceeds on an international voyage, not later than the first survey on or after 1 January 2017;
 - (b) a ship of 300 gross tonnage or more constructed on or after 1 January 2017 that proceeds on an international voyage;
 - (c) a ship of 500 gross tonnage or more constructed before 1 January 2017 but on or after 25 May 1980 that proceeds beyond restricted limits, not later than the first survey on or after 1 January 2017;
 - (d) a ship of 500 gross tonnage or more constructed on or after 1 January 2017 that proceeds beyond restricted limits.
- (2) The master of the ship must ensure that the automatic identification system is in operation at all times.
- (3) The automatic identification system must be tested annually in accordance with regulation 18.9 of Chapter V of SOLAS.

Towing gear

40C.60 Towing gear

Any ship that is fitted with means of towing other ships must meet the following requirements:

- (a) the design of the towing gear must be such as to minimise any heeling moment due to the lead of the towline. For this purpose, the towing hook or towing post or towing bollard or towing winch, and any towing fairleads, must be located at the minimum practicable height above the waterline:

- (b) towing hooks and towing posts and towing bollards must have positive means of quick release that can be relied on to function correctly under load and for all directions of applied load and expected heel angles:²⁶
- (c) towing winches must have an emergency means of rapidly paying out when under load:
- (d) the towing gear and the supporting structure must be strong enough to withstand loads imposed during towing operations. The towing line must be the weakest link in the towing arrangement.

Section 2 – Pilot boats

General

40C.61 Definitions relating to section 2

In this section:

pilot boat means any ship used to transfer pilots between the shore and a ship.

40C.62 Pilot boats

In addition to the requirements in rules 40C.12 to 40C.60, a pilot boat must meet the following requirements:

- (a) a forward facing door must not be the normal means of access from the open deck to accommodation space provided for the use of pilots, unless it is reasonably protected from water and spray coming aboard the boat and has a substantial coaming and other provisions to limit the ingress of any water:
- (b) pilot access to the pilot ladder must be visible to the person at the helm. There must be adequate visibility of the pilot access in both the vertical and horizontal planes:
- (c) side decks must provide safe access for personnel, taking into account the height and shape of adjacent coamings, superstructure and deckhouses. On post-27 May 2004 boats, there must be a 400 mm minimum width of side deck inboard of the bulwark, guard rails or toe rail.²⁷
- (d) seating must be provided for the crew and all pilots to be carried. Seat belts must be provided for the safety of the crew and pilots on post-27 May 2004 boats capable of speeds of 15 knots or more:
- (e) a searchlight must be fitted that can be adjusted by the person at the helm and that is capable of illuminating the ship's side in way of a pilot ladder and the sea area around the pilot boat:
- (f) unless a surveyor is satisfied that there are other adequate means of ensuring the safety of persons on deck, an efficient continuous safety rail system for clip-on safety harnesses must be provided. The system must allow the harness traveller to move freely and without adjustment over the full length of the safety rail. The rail system, its attachment to the boat's structure and the clip-on safety harnesses must be designed, constructed, installed, tested and maintained to a surveyor's satisfaction:
- (g) rescue retrieval equipment must be provided as follows:²⁸

²⁶ It is recommended that release mechanism be controlled from the wheelhouse and at the towing hook or towing post or towing bollard itself. The local control at the hook or towing post or towing bollard should preferably be of the direct mechanical type capable of independent operation. Towing post and towing bollard release mechanisms may be situated within the towing hawser.

²⁷ It is recommended that the width of side decks also allow for a 30 degree roll of the boat without the houses and other deck erections coming into contact with a ship's side.

²⁸ It is recommended that an effective mechanical means for retrieval of any person who falls overboard is also provided. Where such a device is fitted, it should be demonstrated and maintained to the satisfaction of a surveyor.

- (i) a safe, practical and immediate means of retrieving a person from the water; and
- (ii) at least 2 buoyant lifelines that are each of not less than 18 metres in length. Each of the lifelines must have a quoit of appropriate weight secured to one end:
- (h) where rescue retrieval equipment is fitted at the stern, physical arrangements, to the satisfaction of a surveyor, must be made for protecting a person in the water from injury by the boat's propeller or propellers;
- (i) distress flares must be carried in accordance with the provisions of Appendix 3 but pilot boats must be provided with no less than
 - (i) 4 parachute white illuminating flares for emergency use at night; and
 - (ii) 6 red rocket parachute flares.

40C.63 Other boats used as pilot boat

A boat other than a boat that complies with rule 40C.62 may be used as a means of transferring pilots to ships if it complies with the requirements of rules 40C.12 to 40C.60 inclusive and has, to the satisfaction of a surveyor,—

- (a) arrangements permitting the pilot safe access to and from the pilot ladder; and
- (b) adequate artificial lighting of the pilot boarding activities area; and
- (c) visibility of the pilot access to the boarding ladder from the helm area; and
- (d) equipment for and rapid means of retrieving a person from the water.

Section 3 – Marine farming vessels

General

40C.64 Definitions relating to section 3

In this section:

marine farming means the farming of fin fish, shell fish or marine vegetation;

marine farming vessels means boats, barges and other craft used in navigation²⁹ that are solely employed in servicing marine farming plant and installations within enclosed waters or similar sheltered waters;

oyster farming means oyster farming by intertidal wrack cultivation;

similar sheltered waters means waters that a surveyor considers have similar protection and environmental characteristics to defined enclosed water limits.

40C.65 Application of this Part to marine farming vessels

- (1) A marine farming vessel exclusively engaged in oyster farming operations is only required to comply with the following:
 - (a) a post-27 May 2004 vessel of 7.5 metres or more in length overall must comply with the requirements of rules 40C.7 to 40C.9 inclusive; and
 - (b) the owner of every vessel must ensure that the vessel is provided, to the satisfaction of a surveyor, with—
 - (i) a means of communication with persons on shore; and
 - (ii) an anchor and cable appropriate to the vessel's size and operation; and
 - (iii) one portable fire extinguisher that complies with rule 42B.57 that is suitable for extinguishing an oil fire; and

²⁹ The requirements of Part 40C do not apply to moored barges, rafts or other stationary floating structures on which product is grown. These are not ships to which the Maritime Transport Act 1994 applies.

- (iv) in the case of a powered barge, one lifebuoy that complies with rule 42A.17; and
- (v) in the case of any vessel other than a powered barge, one lifejacket or buoyancy vest, that complies with rule 42A.19 or 42A.20 respectively, for each person carried.

(2) A post-27 May 2004 marine farming vessel, other than a vessel to which rules 40C.65(1) or 40C.65(6) apply, must comply with rules 40C.18, 40C.19, 40C.21, 40C.23 to 40C.42 inclusive and 40C.48 to 40C.50 inclusive, as applicable.

(3) A post-27 May 2004 marine farming vessel of 12 metres or more in length overall, other than a vessel to which rules 40C.65(1) or 40C.65(6) apply, must comply with rule 40C.12 and rules 40C.54 to 40C.59 inclusive, as applicable.

(4) A post-27 May 2004 marine farming vessel of—

- (a) 12 metres or more in length overall that does not proceed beyond enclosed waters; and
- (b) 7.5 metres or more in length overall that proceeds beyond enclosed waters, other than a vessel to which rules 40C.65(1) or 40C.65(6) apply, must comply with rule 40C.13.

(5) (a) Except as provided in rule 40C.65(5)(b), a marine farming vessel of more than 6 metres in length overall other than a vessel to which rules 40C.65(1) or 40C.65(6) apply, must comply with rule 40C.15.

(b) A motorised barge that—

- (i) does not operate beyond restricted limits; and
- (ii) is of less than 24 metres in length overall; and
- (iii) has weather deck openings of not more than 1 square metre that are fitted with coamings and weathertight covers,

must have a freeboard measured down from the lowest point of the weather deck of not less than 200 mm for a vessel of 6 metres in length overall and not less than 375 mm for a vessel of 24 metres in length overall. For a ship of intermediate length, the freeboard must be determined by linear interpolation.

(6) A barge used exclusively for marine farming purposes and that is 24 metres or more in length overall or carries any persons on board during a voyage, other than a barge to which rule 40C.65(1) applies, must comply with the requirements of rules 40C.71, 40C.72, and 40C.75, and (if proceeding beyond enclosed waters) rule 40C.73.

(7) A marine farming vessel that does not proceed beyond enclosed waters and is fitted with a cockpit is not required to comply with rules 40C.15(2)(c) and 40C.21(8).

40C.66 Design and construction

(1) A post-27 May 2004 marine farming vessel, other than a vessel to which rule 40C.65(1) or rule 40C.66(3) applies, that is 7.5 metres or more in length overall must comply with rules 40C.7 to 40C.9 inclusive, as applicable.

(2) A marine farming vessel must comply with rule 40C.9(1).

(3) A barge used exclusively for marine farming purposes must comply with the applicable requirements of rule 40C.71.

40C.67 Bulwarks and guard rails

(1) Except as provided in rule 40C.67(2), a marine farming vessel must comply with the requirements of rule 40C.20.

- (2) Where compliance with rule 40C.20 would impede the proper working of a marine farming vessel, bulwarks and guard rails may be omitted partially or totally, if a surveyor is satisfied that—
 - (a) there is no danger to personnel aboard the vessel when underway; or
 - (b) other safety measures are available.

40C.68 Safety equipment

- (1) Except as provided in rule 40C.68(2), a marine farming vessel, other than a vessel to which rule 40C.65(1) or rule 40C.65(6) applies, must meet the following requirements:
 - (a) Fire fighting appliances
Marine farming vessels of more than 6 metres in length overall must meet the requirements of rule 40C.51 and Appendix 2, except that—
 - (i) ships of less than 24 metres in length overall are not required to be provided with an additional 2 fire buckets if the fire pump is situated in a machinery space; and
 - (ii) ships of less than 15 metres in length overall are not required to carry a fire axe and safety lamp; and
 - (iii) ships of 6 metres or less in length overall may be equipped with a bailer instead of a fire bucket.
 - (b) Life saving appliances
(i) Marine farming vessels except barges must meet the requirements of rule 40C.52 and Appendix 3, except that vessels of 6 metres or less length overall need only be provided with lifejackets with a buoyancy of at least 71 Newtons for every person on board and 2 smoke floats. The 2 smoke floats are not required if a surveyor is satisfied that the ship operates only within visual contact of a shore base.
(ii) Barges are not required to carry life saving appliances unless they carry persons during a voyage, in which case—
 - (aa) a lifebuoy that complies with rule 42A.17 must be carried; or
 - (bb) each person on board must be wearing a buoyancy vest that complies with rule 42A.20.
 - (c) Radio
Marine farming vessels must meet the requirements of Appendix 4 except where a surveyor is satisfied that—
 - (i) the vessel only works within visual contact of a shore station; and
 - (ii) other satisfactory means of voice communication are available.
- (2) Where a marine farming vessel operates only in water of not more than 1.5 metres depth, a surveyor may permit the vessel to operate without any of the safety equipment specified in Appendices 2, 3 and 4 of this Part.

Section 4 – Barges

General

40C.69 Application of section 4

- (1) Rules 40C.71 to 40C.83 inclusive apply to—
 - (a) a New Zealand barge of 24 metres or more in length that carries for hire and reward any cargo, wastes, dredgings or other material; and
 - (b) a barge that carries persons on board during the course of a voyage within New Zealand waters; and

(2) Rule 40C.71(2) applies to a barge that is fitted with or carries a crane or other lifting device.

40C.70 Definitions relating to section 4

In this section:

barge means any barge, lighter, or like vessel that does not have any means of self propulsion;

length (L) means 96 percent of the total length measured on a waterline at 85 percent of the least moulded depth;

moulded depth means the depth at amidships, from the horizontal line through the upper surface of the bottom plating at the centreline, to the underside of the deck at the barge's side;

New Zealand barge means any barge that is registered under the Ship Registration Act 1992; and includes a barge that is not registered under that Act but is required or entitled to be registered under that Act.

Construction

40C.71 Construction

(1) A barge to which rule 40C.69(1) applies must meet the construction requirements in rules 40C.9(1) to (4) inclusive and rule 40C.9(8).

(2) A barge to which rule 40C.69(2) applies must meet the stability requirements of clause 1.3 of Appendix 1 of this Part.

40C.72 Watertight bulkheads

(1) A barge must be fitted with a watertight collision bulkhead located at a distance aft of the forward end of length (L)³⁰ shown in Table 40C.6.

Table 40C.6

Length of Barge (L)	Not less than	Not more than
< 200 metres	0.05L metres	0.05L + 3.66 metres
> 200 metres	10 metres	0.08L metres

(2) Where a chain locker is fitted abaft the collision bulkhead, it must be made watertight.

40C.73 Deck openings

(1) For a barge of 24 metres or more in length, deck openings for hatches and air pipes must be protected in accordance with the requirements of Part 47.

(2) For a barge of less than 24 metres in length—

- cargo hatches must be protected by weathertight covers and coamings of at least,—
 - if the barge is not proceeding beyond enclosed waters, 300 mm in height; and
 - if the barge is proceeding beyond enclosed waters, 600 mm in height; and
- other deck openings must be provided with coamings or doors leading to openings that have sills of a minimum height of at least,—
 - if the barge is not proceeding beyond enclosed waters, 150 mm; and
 - if the barge is proceeding beyond enclosed waters, 300 mm.

³⁰ Barges having no distinct fore or aft end which can be towed or pushed from either end will have this bulkhead at both ends.

40C.74 Bulwarks and guard rails

- (1) A barge that carries any person on board during a voyage must be fitted with bulwarks or guard rails on any deck or part of a deck to which those persons have access during the voyage.
- (2) Where such bulwarks or guard rails are fitted, they must meet the requirements of rule 40C.20 and rule 40C.21.

40C.75 Bilge system

- (1) A barge that does not carry any person on board during a voyage and is fitted with below deck machinery spaces, or has fixed piping systems led through void spaces, must be provided with a means of pumping from and draining such spaces.³¹
- (2) A barge that carries 12 persons or more on board during a voyage must be provided with bilge pumps and a bilge system that—
 - (a) is capable of draining any compartment below the deck; and
 - (b) complies with rules 40C.24, 40C.25 and 40C.26.
- (3) A barge that carries less than 12 persons on board during a voyage must meet the requirements of rules 40C.24 and 40C.26, except that manual pumps may be substituted for the power pump requirements of rule 40C.24.

40C.76 Air pipes

- (1) The following tanks, void spaces and cofferdams of barges must be fitted with air pipes:
 - (a) all tanks containing flammable liquids, combustible liquids or chemicals; and
 - (b) all tanks, cofferdams and voids adjacent to tanks containing flammable liquids, combustible liquids or chemicals; and
 - (c) all voids through which pressure piping passes; and
 - (d) all tanks that are filled or emptied through fixed pumping arrangements.
- (2) Air pipes must—
 - (a) meet the requirements of Part 47; and
 - (b) be of substantial construction; and
 - (c) be fitted with flame screens where necessary.

40C.77 Cargo piping systems

- (1) Cargo piping systems for low flashpoint liquids (at or below 60 degrees C Closed Cup Test) must—
 - (a) be independent of all other piping systems; and
 - (b) not pass through—
 - (i) fuel oil tanks; or
 - (ii) spaces containing machinery, where sources of vapour ignition are normally present.
- (2) Cargo pumps must be so designed as to minimise the danger of sparking.
- (3) Cargo piping and other arrangements for barges intended for the carriage of dangerous chemicals in bulk must comply with the requirements of the *International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code)* adopted by the International Maritime Organisation by resolution MSC.4(48).
- (4) Cargo piping and other arrangements for barges intended for the carriage of liquefied gases in bulk must comply with the requirements of the *International Code for the*

³¹ The means may be by use of suitable hand pumps and fixed bilge piping systems or by means of portable pumps stored onboard the barge.

Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code)
adopted by the International Maritime Organisation by resolution MSC.5(48).

Safety equipment

40C.78 Fire fighting appliances

(1) Machinery spaces of barges that do not carry persons on board during a voyage must be provided with fire extinguishers—
(a) in accordance with Table 40C.7; and
(b) that comply with Part 42B.

Table 40C.7

Machinery Spaces	Fire Extinguishers
Spaces containing oil fired boilers or oil fuel units	1 foam fire extinguisher of at least 135 litres capacity that complies with rule 42B.53 or one CO ₂ fire extinguisher of at least 45 kgs capacity that complies with rule 42B.54. At least 2 portable fire extinguishers that comply with rule 42B.57 and are suitable for extinguishing an oil fire.
Spaces containing an internal combustion engine	For each 750 kW brake power, 1 portable extinguisher that complies with rule 42B.57 and is suitable for extinguishing an oil fire, provided that there must not be less than 2 such portable extinguishers and need not be more than 6 such portable extinguishers in each space.
Spaces containing electric generators or large electric motors that do not have an enclosed ventilation system	For each generator or motor, 1 portable extinguisher that complies with rule 42B.57 and is suitable for an electrical fire.
Spaces containing emergency electric motors or generators	Outside and adjacent to the exit from the space, 1 portable extinguisher that complies with rule 42B.57 and is suitable for an electrical fire.
Cranes with internal combustion engines	For each crane, 1 portable extinguisher that complies with rule 42B.57 and is suitable for extinguishing an oil fire.

(2) A barge that carries any person on board must,—
(a) if it carries passengers on board during a voyage, meet the applicable requirements of rule 40A.55; and
(b) if it carries persons on board during a voyage, but does not carry passengers, meet the applicable requirements of rule 40C.51.

(3) The owner of the barge must ensure that the fire appliances are maintained, inspected and serviced in accordance with the requirements of Part 42B.

(4) The master of the barge must ensure that all fire appliances are in working order and ready for immediate use before the barge commences a voyage.

40C.79 Life saving appliances

(1) The owner of a barge that does not carry persons on board during a voyage but which has persons on board during loading or unloading, or at any other time when the barge is afloat and not underway, must ensure that at least two lifebuoys that comply with rule 42A.17 are carried and readily available at such times.

- (2) A barge that carries any person on board must,—
 - (a) if the barge carries 4 or more persons, be provided with one or more liferafts of sufficient aggregate capacity to accommodate all persons on board. The liferafts must meet the requirements of rules 42A.11 and 42A.12 and must be stowed so as to be readily placed in the water on either side of the barge; and
 - (b) be provided with at least 2 lifebuoys that comply with rule 42A.17, one of which must be provided with a buoyant lifeline; and
 - (c) be provided with a lifejacket for every person on board. Lifejackets must meet the requirements of rule 42A.19 and must have a buoyancy of at least 71 Newtons if the barge is operating in restricted limits, and at least 100 Newtons if operating in the coastal limit. One lifejacket that complies with rule 42A.19 and is suitable for children must be provided for each child carried; and
 - (d) be provided with at least 6 rocket parachute flares when proceeding beyond restricted limits, at least 2 rocket parachute flares and 2 buoyant smoke signals when operating within inshore limits, and at least 2 buoyant smoke signals and 2 hand flares if operating in enclosed waters only. The rocket parachute flares, buoyant smoke floats and hand held flares must comply with rules 42A.22, 42A.24 and 42A.23 respectively.
- (3) The owner of the barge must ensure that the life saving appliances are maintained, inspected and serviced in accordance with the requirements of Part 42B.
- (4) The owner of the barge must ensure that all life saving appliances are in working order and ready for immediate use before the barge commences a voyage.

40C.80

Radiocommunication

A barge that carries any person on board must—

- (a) if it carries passengers on board during a voyage, meet the applicable requirements of rule 40A.57; and

if it carries persons on board during a voyage, but does not carry passengers, meet the applicable requirements of rule 40C.53.

Miscellaneous

40C.81

Crew accommodation

A barge that carries person on board during a voyage, but does not carry passengers, must meet the applicable requirements of rules 40C.16, 40C.17 and 40C.35.

40C.82

Passengers

- (1) A barge that carries passengers on board during a voyage must meet the requirements of rules 40A.12 to 40A.21 inclusive and rules 40A.25 and 40A.42.
- (2) The owner of a barge must ensure that passengers are not carried on any barge that is used, has been used or is intended to be used, for carrying oil, chemicals or liquefied gas in bulk or dangerous goods as cargo.

40C.83

Anchors and Cables

The owner of a barge must ensure that the barge is provided with anchors and cables in accordance with the requirements of—

- (a) a classification society listed in rule 40C.9(2)(a); or
- (b) Table 5 in Appendix 6.

The equipment numeral to be used with table 5 in Appendix 6 is:

$$EN = \Delta^{2/3} + 2(Ba + bh) + 01.A$$

Where EN = equipment numeral

- Δ = moulded displacement, in tonnes, to the maximum design waterline
- B = maximum moulded breath, in metres.
- a = distance in metres from the maximum design waterline to the upper edge of the uppermost complete deck, at side amidships.
- b = breadth of the widest superstructure or deckhouse on each tier, in metres.
- h = height in metres at the centreline of each tier of superstructure or deckhouse having a breadth greater than B/4. Sheer, camber and trim may be ignored in measuring h.
- A = profile area in m² of the hull above the maximum design waterline, and superstructures and deckhouses that have a breadth greater than B/4, within the overall length. Screens and bulwarks more than 1.5 metres in height must be regarded as parts of deckhouses when determining h and A.

rule.40C.13

Appendix 1 Intact stability

1.1 Heeling test

- (1) This clause applies to a post-27 May 2004 ship of less than 15 metres in length overall that—
 - (a) carries cargo weighing not more than 1000 kg; or
 - (b) carries a combination of passengers and cargo weighing not more than 1000 kg; or
 - (c) carries 50 or less persons.
- (2) A ship to which this clause applies must comply with the intact stability requirements prescribed in subclauses (3) to (6).
- (3) The ship must be tested in the fully loaded condition by a surveyor to ascertain the angle of heel and the position of the waterline that would result if the helmsman is at the helm and—
 - (a) all other persons that the ship is certified to carry³² are assembled along one side of the ship for the purposes of the test; or
 - (b) if the ship carries cargo, the combined weight of cargo and persons the ship is certified to carry are assembled along one side of the ship for the purposes of the test.
- (4) Each person, including the helmsman, must be substituted by a mass of at least 75 kg for the purpose of the test.
- (5) The ship will be judged satisfactory by a surveyor if the test shows that—
 - (a) the angle of heel does not exceed 15°; and
 - (b) in the case of a ship with a weathertight deck, the freeboard to the deck or, if the ship has no side deck, to the top of the cockpit coaming is not less than 75 mm at any point; and
 - (c) in the case of an open boat, the freeboard to the top of the gunwale is not less than 250 mm at any point;
- (6) If a ship is fitted with a cockpit, it must be demonstrated that the ship—
 - (a) has a reserve of buoyancy when the cockpit is full of water; and
 - (b) does not heel more than 15° when the cockpit is full of water.

1.2 Inclining test and stability criteria

- (1) This clause 1.2 applies to a ship—
 - (a) of 15 metres or more in length overall; or
 - (b) that carries cargo weighing more than 1000 kg; or
 - (c) that carries a combination of passengers and cargo weighing more than 1000 kg; or
 - (d) that carries more than 50 persons; or
 - (e) to which clause 1.4 applies; or
 - (f) to which clause 1.5 applies.
- (2) A ship to which this clause applies must comply with subclauses (3) to (8).
- (3) The surveyor that conducts the requirements of subclauses ~~subrules~~ (3) to (8) must be the same surveyor throughout.

³² Where the ship has more than one deck to which persons have access weights representing the number of persons permitted on each deck must be used in the test.

- (4) Except as provided in subclause (5), the lightship weight, vertical centre of gravity (KG), and longitudinal centre of gravity (LCG) of the ship must be determined from the results of an inclining experiment conducted or witnessed by a surveyor.
- (5) A sister ship is not required to conduct an inclining experiment provided the lightship displacement can be measured to within a limit of the lead sister ship that is satisfactory to the surveyor.
- (6) The lightship weight must be increased by a margin for growth that must be 5% of the lightship weight positioned at the intersection of the lightship LCG and whichever is higher—
 - (a) the vertical centre of the weatherdeck amidships; or
 - (b) the lightship KG.
- (7) Curves of statical stability (GZ curves) must be produced by a surveyor for—
 - (a) loaded departure with 100% consumables; and
 - (b) loaded arrival with 10% consumables; and
 - (c) anticipated service conditions; and
 - (d) any condition where a deck cargo is carried; and
 - (e) conditions involving lifting appliances, if relevant.
- (8) The curves of statical stability for the loaded conditions must meet the following criteria—
 - (a) the area under the righting lever curve (GZ curve) must not be less than—
 - (i) 0.055 metre-radians up to 30° angle of heel; and
 - (ii) 0.09 metre-radians up to 40° angle of heel or the angle of downflooding, if this angle is less; and
 - (b) the area under the GZ curve between the angles of heel of 30° and 40° or between 30° and the angle of downflooding if that angle is less than 0.03 metre-radians; and
 - (c) the righting lever (GZ) must be at least 0.20 metres at an angle of heel equal to, or greater than, 30°; and
 - (d) except as provided in paragraph (e), the maximum GZ must occur at an angle of heel of not less than 25°; and
 - (e) if the ship has a hull form that results in the maximum GZ occurring at an angle of heel less than 25° but not less than 15°, this may be accepted by a surveyor if the area under the GZ curve up to the angle (θ_m) at which the maximum GZ occurs is not less than $0.055 + 0.001(30 - \theta_m)$ metre-radians; and
 - (f) after correction for free surface effects, the initial metacentric height (GM) must not be less than 0.35 metres.

1.3 Deck cranes

- (1) This clause applies to a ship, or a barge to which Section 4 applies, that—
 - (a) is fitted with a deck crane or other lifting device; or
 - (b) carries a mobile crane.
- (2) A ship or a barge to which this clause applies must be subjected to a practical test with the ship in its worst anticipated service load condition to establish the angle of heel and the minimum freeboard on the low side.
- (3) Except as provided in subclause (4), with the crane or other lifting device operating at its maximum load moment the angle of heel must not exceed whichever is the lesser angle—
 - (a) 7°; or
 - (b) that angle of heel which results in a freeboard on the low side of 250 mm.
- (4) When an angle of heel greater than 7° but not exceeding 10° occurs, a surveyor may accept the lifting condition if all the following criteria are satisfied when the crane or lifting device is operating at its maximum load moment—

- (a) the range of stability from the angle of static equilibrium is equal to or greater than 20°; and
- (b) the area under the curve of residual righting lever, up to 40° from the angle of static equilibrium or the downflooding angle, if that angle is less than 40°, is equal to or greater than 0.1 metre radians; and
- (c) except as provided in paragraph (d), the minimum freeboard fore and aft throughout the lifting operations is not less than half the assigned freeboard at amidships; and
- (d) for ships with less than 1000 mm assigned freeboard amidships, the freeboard fore or aft must not be less than 500 millimetres.

1.4 Tugs

- (1) A ship that is engaged in towing must meet the standards and requirements in either subclause (2) or (3).
- (2) In respect of a ship referred to in subclause (1)—
 - (a) the tow rope heeling lever curve, which is determined by assuming the bollard pull athwartships at 30° to the horizontal, must be plotted on the curve of righting levers; and
 - (b) the area of the curve of righting levers above the heeling lever curve—
 - (i) up to 40° angle of heel must be calculated; or
 - (ii) the angle of downflooding if that is less than 40° must be calculated; and
 - (c) the proportion of the area calculated in subclause (b) to the total area of the curve of righting levers—
 - (i) from 0° to 40° must not be less than 40%; or
 - (ii) from the angle of downflooding, if that is less than 40°, must not be less than 40%; and
 - (d) the ship meets the standards and requirements in clause 1.2.
- (3) In respect of a ship referred to in subclause (1), the ship is certified as being in accordance with the standards and requirements in clause 1.2 and tug stability standards prescribed by any of the following classification societies:
 - (a) American Bureau of Shipping;
 - (b) Bureau Veritas;
 - (c) DNV GL AS;
 - (d) Lloyd's Register of Shipping;
 - (e) Nippon Kaiji Kyokai.

1.5 Dredgers

- (1) A ship that is engaged in dredging must meet the requirements of clause 1.2.
- (2) Dredgers and hopper barges that operate with open hold spaces must have their stability investigated by—
 - (a) the 'spill out'³³ method; or
 - (b) an alternative method that the owner or builder can demonstrate to the Director is at least as effective as the 'spill out' method.
- (3) Except as provided in subclause (4), dredgers and hopper barges that operate with their hold spaces closed by hatch covers or other permanent means must have the effects of free surface (suitably amended for density) taken into account when calculating the ship's stability for various conditions of loading.
- (4) A surveyor who is satisfied that, during the collection of dredgings the water content is rapidly removed, may allow the ship's stability to be investigated by assuming that the

³³ For details of the 'spill out' method see Section 8, Sub-section C of the Australian Transport Advisory Council *Uniform Shipping Laws Code*.

dredgings shift as the ship rolls, rather than considering the free surface correction where the intact stability will be considered adequate if, after taking account of the cargo shift—

- (a) the angle of heel does not exceed 65% of the angle at which the deck edge becomes immersed; and
- (b) the residual dynamic stability measured up to 30° beyond the angle of heel is not less than 0.01 metre-radians.

1.6 Stability information

- (1) This clause applies to a ship that—
 - (a) is of 24 metres or more in length; or
 - (b) is engaged in towing operations; or
 - (c) is a dredger; or
 - (d) carries cargo of more than 1000 kg.
- (2) A ship to which this clause applies must be provided with suitable stability information that must be approved by the surveyor that conducted the inclining test.
- (3) A ship fitted with a deck crane or other lifting device that could have a significant effect on the intact stability of the ship must be provided with information and instructions to the master on ship safety when using the deck crane or lifting device³⁴ that must include—
 - (a) the maximum permitted load and outreach that satisfy the requirements of clause 1.3, or the safe working load, whichever is less; and
 - (b) details of all openings leading below deck that should be secured weathertight; and
 - (c) a statement of the need for all personnel to be above deck before lifting operations commence.
- (4) Stability information supplied to a ship to which this clause applies that carries a timber deck cargo³⁵ and proceeds beyond restricted limits must include the following advice to the master—
 - (a) the likely effects of absorption of water on dried or seasoned timber; and
 - (b) loading operations should be ceased if a list develops for which there is no satisfactory explanation; and
 - (c) ensure the ship has no list before proceeding to sea; and
 - (d) a recommended minimum metacentric height when carrying a timber deck cargo; and
 - (e) excessive stability should be avoided because it may result in violent motion in heavy seas, which may cause the timber deck cargo to shift.

³⁴ This may be included with the stability information.

³⁵ For ships of 24 metres or more in length overall, it is recommended that they comply with the requirements of the IMO *Code of Safe Practice for Ships Carrying Timber Deck Cargoes*, 1991.

Rule 40C.51

Appendix 2 Fire fighting appliances

2.1 Ships of less than 500 gross tonnage that undertake an international voyage

The requirements in Appendix 2.1 apply to ships of less than 500 gross tonnage that undertake an international voyage.

Item	Requirement
Fire control plan	In a ship there must be clearly exhibited on board, for guidance of the master and crew, a fire control plan that complies with rule 42B.68.
Fire alarms	<ul style="list-style-type: none"> (1) A post-27 May 2004 ship must be provided with electrically operated firealarm bells in the accommodation spaces, actuated from a control station and from manually operated call points suitably located throughout the accommodation spaces. The fire alarm bells must be provided with electrical power from two separate sources of power, one of which must be the ship's emergency source of power. (2) A pre-27 May 2004 ship must be provided with manually operated fire alarms in the accommodation spaces that are additional to any electrically operated alarm system actuated only from a control station. (3) Manually operated alarm bells must be permanently secured to the ship's structure and clearly labelled as to their purpose.
Fire pumps	<ul style="list-style-type: none"> (1) A ship must be provided with at least one independently driven power fire pump that complies with rule 42B.61 and is capable of delivering at least one jet of water from any fire hydrant. (2) Where the power driven fire pump and its source of power and sea connection are situated within spaces containing oil firedboilers or internal combustion type propelling machinery, an additional power driven fire pump that complies with rule 42B.61 and its source of power and sea connection must be provided outside such spaces.
Fire main, water service pipes, hydrants, hoses and nozzles	<ul style="list-style-type: none"> (1) A ship must be provided with a fire main, water service pipes and hydrants that comply with rule 42B.63. The number and position of the fire hydrants must be such that— <ul style="list-style-type: none"> (a) at least one jet of water from a single length of hose can reach any part of the ship normally accessible to passengers or crew while the ship is being navigated and any store room and any empty part of any cargo space; and (b) in accommodation spaces, service spaces and machinery spaces, the requirements of paragraph (a) can be met when all watertight doors are closed; and (c) every space containing oil fired boilers or internal combustion type propelling machinery is provided with at least one fire hydrant. (2) A ship must be provided with— <ul style="list-style-type: none"> (a) one hose and one spray/jet nozzle for every hydrant in spaces containing oil fired boilers or internal combustion type machinery; and (b) at least 3 hoses, each with a spray/jet nozzle, for use outside such spaces. (3) All hoses and spray/jet nozzles must comply with rules 42B.64 and

	<p>42B.65 respectively.</p> <p>(4) All hose connections must be inter-connectable.</p>
International shore connection	A ship must be provided with an international shore connection that complies with rule 42B.60.
Fixed fire extinguishing installation – Machinery spaces	<p>(1) A ship of 350 gross tonnage or more must be provided with a fixed fire extinguishing system in any machinery space of Category A.</p> <p>(2) A fixed fire extinguishing system in any machinery space of Category A must be—</p> <p>(a) a gaseous fire extinguishing system that complies with rules 42B.20 to 42B.22 inclusive; or</p> <p>(b) a water based system that complies with rules 42B.23 to 42B.26 inclusive; or</p> <p>(c) a high expansion foam system that complies with rule 42B.31.</p>
Non-portable foam and CO ₂ extinguishers	<p>In a ship of less than 350 gross tonnage—</p> <p>(a) any propelling machinery space; and</p> <p>(b) any auxiliary machinery of Category A</p> <p>must be provided with a foam fire extinguisher of at least 45 litres capacity that complies with rule 42B.53 or a CO₂ fire extinguisher of at least 15 kgs capacity that complies with rule 42B.54.</p>
Sand	<p>(1) In a ship, each boiler firing space must be provided with at least 0.25 metres³ of sand or other dry material suitable for quenching oil fires, and a scoop for its distribution.</p> <p>(2) Alternatively, an additional portable fire extinguisher suitable for extinguishing oil fires that complies with rule 42B.57 may be provided.</p>
Portable fire extinguishers	<p>In a ship, portable fire extinguishers that comply with rule 42B.57 must be provided as follows:</p> <p>(a) at least 3, situated so as to be readily available for use in any part of the accommodation and service spaces; and</p> <p>(b) one in each galley; and</p> <p>(c) at least 2, suitable for extinguishing oil fires, in each firing space and in each space that contains any part of any oil fuel installation; and</p> <p>(d) subject to (e), at least one, suitable for extinguishing oil fires, for every 375 kW in any machinery space of Category A; and</p>

	<ul style="list-style-type: none"> (e) in any machinery space of Category A there must be at least 2 portable fire extinguishers but there need not be more than 6 portable fire extinguishers. (f) for every two portable fire extinguishers of the same type, there must be provided one spare charge or a replacement extinguisher of the same type.
Fire smothering blankets	In a ship, each galley must be provided with one fire smothering blanket that complies with rule 42B.67.
Fire crew outfits	A ship must carry 2 fire crew outfits that comply with rule 42B.66 and 2 sets of breathing apparatus that comply with rule 42B.59
Signs	Signs that comply with rule 42B.69 must be provided to identify all fire fighting appliances and their location.

2.2 Offshore limit ships and coastal limit ships

The requirements in Appendix 2.2 apply to ships that proceed in the offshore or coastal limits.

Item	Requirements
Fire alarms	<ul style="list-style-type: none"> (1) A ship of 24 metres or more in length overall built on or after 1 November 1989 must be provided with electrically operated fire alarm bells in the accommodation spaces that are actuated from a control station and from manually operated call points suitably located throughout the accommodation spaces. The fire alarm bells must be provided with electrical power from two separate sources of power, one of which must be the ship's emergency source of power. (2) A ship of 24 metres or more in length overall built before 1 November 1989 that does not meet the fire alarm requirement for ships built on or after that date must be provided with manually operated fire alarms in the accommodation spaces that are additional to any electrically operated alarm system actuated only from a control station. (3) Manually operated alarm bells must be permanently secured to the ship's structure and clearly labelled as to their purpose.
Fire pumps	<ul style="list-style-type: none"> (1) A ship of 24 metres or more in length must be provided with at least one power driven fire pump that complies with rule 42B.61 and is capable of delivering at least one jet of water from any fire hydrant. (2) Where the power driven fire pump and its source of power and sea connection are situated within spaces containing oil firedboilers or internal combustion type propelling machinery, an additional fire pump and its source of power (if any) and sea connection must be provided outside such spaces. This fire pump may be a manual or power driven pump, if it complies with rule 42B.61. (3) A ship of less than 24 metres in length must be provided with at least one power operated fire pump³⁶ that complies with rule 42B.61 and is capable of delivering a jet of water having a throw of at least 6 metres from any fire hydrant, hose or nozzle provided on the ship.
Fire main, water service pipes, hydrants, hoses	<ul style="list-style-type: none"> (1) A ship of 24 metres or more in length overall must be provided with a fire main, water service pipes and hydrants that comply with rule

³⁶ This pump may be driven by the main engine.

and nozzles	<p>42B.63.</p> <p>(2) The number and position of fire hydrants must be such that—</p> <ul style="list-style-type: none"> (a) at least one jet of water from a single length of hose can reach any part of the ship normally accessible to passengers or crew while the ship is being navigated, and any store room and any empty part of any cargo space; and (b) in accommodation spaces, service spaces and machinery spaces, the requirements of paragraph (a) can be met when all watertight doors are closed; and (c) every space containing oil fired boilers or internal combustion type propelling machinery is provided with at least one fire hydrant. <p>(3) A ship of less than 24 metres in length overall must be provided with a fire main, water service pipes and hydrants in accordance with the above requirements except that—</p> <ul style="list-style-type: none"> (a) compliance with paragraph (b) above is not required; and (b) the fire hydrant for spaces containing oil fired boilers or internal combustion type propelling machinery need not be in the space if a surveyor is satisfied that water can be effectively directed into the space from a hydrant located outside the space. <p>(4) A ship of 24 metres or more in length overall must be provided with—</p> <ul style="list-style-type: none"> (a) one hose and one spray/jet nozzle for every hydrant in spaces containing oil fired boilers or internal combustion type machinery; and (b) at least 2 hoses, each with a spray/jet nozzle, for use outside such spaces. <p>(5) A ship of less than 24 metres in length overall must be provided with—</p> <ul style="list-style-type: none"> (a) one hose and one spray/jet nozzle for every hydrant in spaces containing oil fired boilers or internal combustion type machinery; and (b) at least one hose with a spray/jet nozzle, for use outside such spaces. <p>(6) All hoses must comply with rule 42B.64 and all spray/jet nozzles must comply with rule 42B.65.</p> <p>(7) All hose connections must be inter-connectable.</p>
Fixed fire extinguishing installation – Machinery Spaces	<p>(1) A ship of 24 metres or more in length overall must be provided with a fixed fire extinguishing system in any machinery space containing an oil fired boiler, oil fuel settling tank or oil fuel unit, but where any oil fired boiler, oil fuel settling tank or oil fuel unit is fitted in a space containing internal combustion machinery and the largest single area over which oil fuel may spread in the event of a leakage is less than 9 metres², a fixed fire extinguishing system need not be fitted.</p> <p>(2) A fixed fire extinguishing system must be—</p> <ul style="list-style-type: none"> (a) a gaseous fire extinguishing system that meets the requirements of rules 42B.20 to 42B.22 inclusive; or (b) a water based system that complies with rules 42B.23 to

	<p>42B.26 inclusive; or</p> <p>(c) a high expansion foam system that complies with rule 42B.31.</p> <p>(3) Where an engine room and boiler room are not entirely separated by a bulkhead or where fuel oil can drain from the boiler room to the engine room, the combined engine and boiler room must be regarded as a single space for the purpose of the above requirement.</p>
Non-portable foam and CO ₂ extinguishers	<p>(1) A ship of 24 metres or more in length overall in which an oil fired boiler, oil fuel settling tank or oil fuel unit is fitted within a space containing internal combustion type machinery, and in which a fixed fire extinguishing system is not fitted, must be provided with a foam fire extinguisher of at least 135 litres capacity that complies with rule 42B.53 or a CO₂ fire extinguisher of at least 45kgs capacity that complies with rule 42B.54.</p> <p>(2) In a ship of 24 metres or more in length overall that has spaces containing steam turbines or steam reciprocating engines that are not fitted with a fixed fire extinguishing system, there must be provided in those spaces a foam fire extinguisher of at least 45 litres capacity or a CO₂ fire extinguisher of at least 15kgs capacity.</p> <p>(3) In a ship of less than 24 metres in length overall, every space containing any oil fired boiler, oil fuel settling tank or oil fuel unit must be provided with at least one foam fire extinguisher of at least 45 litres capacity that complies with rule 42B.53 or one CO₂ fire extinguisher of at least 15kgs capacity that complies with rule 42B.54.³⁷</p> <p>(4) In every ship, each machinery space of Category A containing internal combustion type machinery that is not provided with a fixed fire extinguishing system must be provided with at least one foam fire extinguisher of at least 45 litres capacity that complies with rule 42B.53 or one CO₂ fire extinguisher of at least 15kgs capacity that complies with rule 42B.54.</p>
Sand	<p>(1) In a ship of 24 metres or more in length overall, each boiler firing space must be provided with at least 0.25 metres³ of sand or other dry material suitable for quenching oil fires, and a scoop for its distribution.</p> <p>(2) In a ship of less than 24 metres in length overall, each boiler firing space must be provided with at least 0.1 metres³ of sand or other dry material suitable for quenching oil fires, and a scoop for its distribution.</p> <p>(3) As an alternative to (1) and (2), an additional portable fire extinguisher suitable for extinguishing oil fires that complies with rule 42B.57 may be provided.</p>
Portable fire extinguishers	<p>(1) In a ship of 24 metres or more in length overall, portable fire extinguishers that comply with rule 42B.57 must be provided as follows:</p> <p>(a) at least 3, situated so as to be readily available for use in any part of the accommodation and service spaces; and</p> <p>(b) one in each galley; and</p>

³⁷ Where an oil fired boiler, oil fuel settling tank or oil fuel unit is located in a machinery space of Category A containing internal combustion machinery, this requirement is additional to the nonportable extinguisher requirements of that space.

	<ul style="list-style-type: none"> (c) at least 2, suitable for extinguishing oil fires, in each firing space and in each space that contains any part of any oil fuel installation; and (d) at least 2, suitable for extinguishing oil fires, in any propelling machinery space and at least one in any auxiliary machinery space, but in such spaces there must be sufficient in number so located that there is no more than 10 metres walking distance from any point in the space to the extinguisher. (e) for every two portable fire extinguishers of the same type there must be provided one spare charge or one replacement extinguisher of the same type. <p>(2) In a ship of less than 24 metres in length overall, portable fire extinguishers that comply with rule 42B.57 must be provided as follows:</p> <ul style="list-style-type: none"> (a) at least one, suitable for extinguishing oil fires, in each firing space and in each space that contains any part of any oil fuel installation; and (b) at least 3, of which 2 must be of a type suitable for extinguishing oil fires and must be located in or adjacent to the machinery spaces. The number and location of portable extinguishers must be such that a surveyor is satisfied that they will be readily available in the event of a fire in any accommodation, service or machinery space.
Fire smothering blankets	In a ship of 24 metres or more in length overall, each galley must be provided with one fire smothering blanket if the galley is fitted with a stove that has exposed heating elements, burners or other open cooking arrangements.
Fire crew outfits	<p>(1) A ship of 24 metres or more in length overall must carry two fire crew outfits that comply with rule 42B.66. and two sets of breathing apparatus that complies with rule 42B.59.</p> <p>(2) A ship of less than 24 metres in length overall must be provided with one fire axe and one safety lamp that comply with rule 42B.66.</p>
Signs	Signs that comply with rule 42B.69 must be provided to identify all fire fighting appliances and their location.

2.3 Restricted coastal and restricted limit ships

The requirements in Appendix 2.3 apply to ships that proceed in a restricted coastal limit or within restricted limits only.

Item	Requirement
Fire control plans	In a ship of 45 metres or more in length overall that does not proceed beyond restricted limits, there must be clearly exhibited on board the ship, for the guidance of the master and crew, a fire control plan that complies with rule 42B.68.
Fire alarms	<p>(1) A ship of 24 metres or more in length overall built on or after 1 November 1989 must be provided with electrically operated fire alarm bells in the accommodation spaces that are actuated from a control station and from manually operated call points suitably located throughout the accommodation spaces. The fire alarm bells must be provided with electrical power from two separate sources of power, one of which must be the ship's emergency</p>

	<p>source of power.</p> <p>(2) A ship of 24 metres or more in length overall built before 1 November 1989 that does not meet the fire alarm requirement for ships built on or after that date must be provided with manually operated fire alarms in the accommodation spaces that are additional to any electrically operated alarm system actuated only from a control station.</p> <p>(3) Manually operated alarm bells must be permanently secured to the ship's structure and clearly labelled as to their purpose.</p>
Fire pumps	<p>(1) A ship of 45 metres or more in length overall that does not proceed beyond restricted limits must be provided with at least 2 power operated fire pumps that comply with rule 42B.61, each capable of delivering at least one jet of water from any fire hydrant provided in the ship.</p> <p>(2) If in a ship of 45 metres or more in length overall that does not proceed beyond restricted limits, a fire in any one compartment would put all the fire pumps out of action, there must be provided, in a position outside that compartment, an independently driven emergency fire pump that complies with rule 42B.61.³⁸</p> <p>(3) A ship of 24 metres or more but less than 45 metres in length overall must be provided with at least one power operated fire pump that complies with rule 42B.61 and is capable of delivering at least one jet of water from any fire hydrant provided in the ship.</p> <p>(4) If, in a ship of 24 metres or more but less than 45 metres in length overall that proceeds in a restricted coastal limit, the main fire pump and its source of power and sea connection are not situated outside a compartment containing oil fired boilers, oil fuel settling tank, fuel oil units or internal combustion type propelling machinery, a manually operated emergency fire pump that complies with rule 42B.61 must be provided.</p> <p>(5) A ship of 15 metres or more but less than 24 metres in length overall must be provided with at least one power operated fire pump³⁹ that complies with rule 42B.61 and that is capable of delivering one jet of water having a throw of at least 6 metres from any fire hydrant, hose or nozzle provided on the ship.</p> <p>(6) A ship of less than 15 metres in length overall must be provided with either—</p> <p>(a) one power operated^{39A} or manually operated fire pump having a permanent sea connection; or</p> <p>(b) at least 2 fire buckets in ships of more than 6 metres in length overall and one fire bucket in ships of 6 metres or less in length overall. Fire buckets must comply with rule 42B.62.</p> <p>(7) If, in a ship of less than 24 metres but more than 6 metres in length overall the fire pump is fitted in a machinery space, 2</p>

³⁸ The emergency fire pump may be a portable pump.

³⁹ & ^{39A} This pump may be operated by the main engine.

	<p>additional fire buckets must be provided.</p> <p>(8) In any open boat of 6 metres or less in length overall, a surveyor may accept a suitable bailer instead of a fire bucket.</p>
Fire main, water service pipes, hydrants, hoses and nozzles	<p>(1) A ship of 15 metres or more in length overall must be fitted with a, fire main, water service pipes and hydrants that comply with rule 42B.63.</p> <p>(2) In a ship of 45 metres or more that proceeds in restricted limits, the arrangement of the fire main and water service pipes and the number and position of fire hydrants must ensure that—</p> <ul style="list-style-type: none"> (a) at least 2 jets of water from separate hydrants, one of which being from a single length of hose, can reach any part of the ship normally accessible to persons while the ship is being navigated and any empty part of any cargo space including any ro-ro cargo space. Such hydrants must be located near the accesses to the protected spaces; and (b) every space containing oil fired boilers or internal combustion type propelling machinery is provided with 2 fire hydrants, one port and one starboard; and (c) a fire hydrant is located in any shaft tunnel at the end adjacent to the machinery space. <p>(3) In a ship of 24 metres or more but less than 45 metres in length that proceeds in a restricted coastal limit, the number and location of fire hydrants must be such that—</p> <ul style="list-style-type: none"> (a) at least one jet of water from a single length of hose can reach any part of the ship's accommodation and service spaces and any empty part of any cargo space; and (b) the requirement in (a) can be complied with when all watertight doors are closed; and (c) every space containing oil fired boilers or internal combustion type propelling machinery is provided with one fire hydrant. <p>(4) In a ship of 15 metres or more but less than 45 metres in length, except a ship of 24 metres or more that proceeds in a restricted coastal limit, the number and location of fire hydrants must be such that—</p> <ul style="list-style-type: none"> (a) at least one jet of water from a single length of hose can reach any part of the ship's accommodation and service spaces and any empty part of any cargo space; and (b) every space containing oil fired boilers or internal combustion type propelling machinery is provided with one fire hydrant, provided that no hydrant need be fitted in the space if a surveyor is satisfied that water can be effectively directed into the space from a hydrant located outside the space. <p>(5) A ship of 45 metres or more in length that proceeds in restricted limits must be provided with—</p> <ul style="list-style-type: none"> (a) one hose and spray/jet nozzle for every hydrant in a space containing oil fired boilers or internal combustion type machinery or in a shaft tunnel; and (b) not less than 3 hoses and spray/jet nozzles for hydrants outside the machinery spaces.

	<ul style="list-style-type: none"> (6) A ship of 15 metres or more but less than 45 metres in length overall must be provided with— <ul style="list-style-type: none"> (a) one hose and one spray/jet nozzle for every hydrant fitted in spaces containing oil fired boilers or internal combustion type machinery; and (b) at least one other hose and spray/jet nozzle, provided that, if only one hydrant is fitted in the ship, only one hose and spray/jet nozzle must be provided. (7) Hoses and nozzles must comply with rules 42B.64 and 42B.65 respectively. (8) All hose connections must be inter-connectable.
Fixed fire extinguishing installation – Machinery Spaces	<ul style="list-style-type: none"> (1) A ship of 45 metres or more in length overall that proceeds in restricted limits must be provided with a fixed fire extinguishing system in any space containing any oil fired boiler, oil fuel settling tank or oil fuel unit. (2) A fixed fire extinguishing system fitted in a space referred to in (1) must be— <ul style="list-style-type: none"> (a) a gaseous fire extinguishing system that complies with rules 42B.20 to 42B.22 inclusive; or (b) a water based system that complies with rules 42B.23 to 42B.26 inclusive; or (c) a high expansion foam system that complies with rule 42B.31. (3) If an engine room and boiler room are not entirely separated by a bulkhead, or where fuel oil can drain from the boiler room to the engine room, the combined engine and boiler room must be regarded as a single space for the purpose of the above requirement. (4) If rule 40C.29 requires a fixed fire extinguishing system to be fitted in an enclosed space containing a propelling engine or fuel tank using petrol or other fuel having a flash point below 60 degrees C, a fixed installation that discharges CO₂ and complies with rule 42B.21(7) must be fitted.
Non-portable foam and CO ₂ extinguishers	<ul style="list-style-type: none"> (1) In a ship of 24 metres or more in length overall that is not provided with a fixed fire extinguishing system in any space containing any oil fired boiler, oil fuel settling tank or oil fuel unit, there must be provided in that space at least one foam fire extinguisher of not less than 135 litres capacity that complies with rule 42B.53 or one CO₂ fire extinguisher of not less than 45kgs capacity that complies with rule 42B.54. (2) In a ship of 24 metres or more in length overall that is not provided with a fixed fire extinguishing system in any machinery space of Category A containing internal combustion type machinery, steam turbines or enclosed pressure lubricated steam engines, there must be provided in that space at least one foam fire extinguisher of not less than 45 litres capacity that complies with rule 42B.53 or one CO₂ fire extinguisher of not less than 16 kgs capacity that complies with rule 42B.54.
Sand	<ul style="list-style-type: none"> (1) In a ship of 24 metres or more in length overall, each boiler firing space must be provided with at least 0.25 metres³ of sand or

	<p>other dry material suitable for quenching oil fires, and a scoop for its distribution.</p> <p>(2) In a ship less than 24 metres in length overall, each boiler firing space must be provided with at least 0.1 metres³ of sand or other dry material suitable for quenching oil fires, and a scoop for its distribution.</p> <p>(3) Alternatively, an additional portable fire extinguisher suitable for extinguishing oil fires that complies with rule 42B.57 may be provided.</p>
Portable fire extinguishers	<p>(1) In a ship of 24 metres or more in length overall, portable fire extinguishers that comply with rule 42B.57 must be provided as follows:</p> <p>(a) at least 3, situated so as to be readily available for use in any part of the accommodation and service spaces; and</p> <p>(b) one in each galley; and</p> <p>(c) at least 2, suitable for extinguishing oil fires, in each firing space and in each space that contains any part of any oil fuel installation; and</p> <p>(d) at least 2, suitable for extinguishing oil fires, in any propelling machinery space and at least one in any auxiliary machinery space but, in such spaces, there must be sufficient in number so located that there is not more than 10 metres walking distance from any point in the space to the extinguisher.</p> <p>(2) A ship of less than 24 metres in length overall must be provided with at least the following number of portable fire extinguishers that comply with rule 42B.57:</p> <p>(a) 3, if the ship is 15 metres or more in length overall; and</p> <p>(b) 2, if the ship is 9 metres or more but less than 15 metres in length overall; and</p> <p>(c) One, if the ship is less than 9 metres in length overall.</p> <p>(3) At least one of these portable fire extinguishers must be of a type suitable for extinguishing an oil fire and located in or adjacent to the machinery spaces. The portable fire extinguishers must be distributed so as to be readily available in the event of a fire in any accommodation, service and machinery space, and must be located to the satisfaction of a surveyor.</p>
Fire smothering blankets	In a ship of 24 metres or more in length overall, each galley must be provided with one fire smothering blanket that complies with rule 42B.67, if the galley is fitted with a stove that has exposed heating elements, burners or other cooking arrangements
Fire crew outfits	<p>(1) A ship of 45 metres or more in length overall that does not proceed beyond restricted limits and a ship of 24 metres or more in length overall that proceeds within a restricted coastal limit must carry 2 fire crew outfits that comply with rule 42B.66 and a breathing apparatus for each fire crew outfit, complying with rule 42B.58 or rule 42B.59.</p> <p>(2) A ship of 12 metres or more but less than 24 metres in length overall must be provided with at least one fire axe and one safety lamp that complies with rule 42B.66.</p>

	<p>(3) A ship of 24 metres or more in length overall that proceeds—</p> <ul style="list-style-type: none">(a) within inshore limits must carry 1 fire crew outfit that complies with rule 42B.66 and 1 breathing apparatus that complies with rule 42B.59; or(b) within enclosed limits must be provided with at least 1 fire axe and 1 safety lamp that complies with rule 42B.66.
Signs	Signs that comply with rule 42B.69 must be provided to identify all fire fighting appliances and their location.

Appendix 3 Life saving appliances

3.1 Ships of less than 500 gross tonnage that undertake an international voyage

The requirements in Appendix 3.1 apply to ships of less than 500 gross tonnage that undertake an international voyage.

Item	Requirement
Survival craft – (comprising lifeboats, rescue boats and liferafts)	<ol style="list-style-type: none">(1) A ship must be provided with liferafts on each side of the ship capable of accommodating all persons on board. If the liferafts cannot be readily transferred for launching on either side of the ship, then liferafts capable of accommodating 150 percent of all persons on board must be provided on each side.(2) Liferafts must be provided with a hydrostatic or similar automatic release to enable the liferafts to float free in the event of the ship sinking. Liferafts must comply with rules 42A.8 and 42A.9.(3) A ship must carry at least one rescue boat that complies with rule 42A.15 and be provided with a launching appliance that complies with rule 42A.28(2).
Lifebuoys	<ol style="list-style-type: none">(1) A ship of 30 metres or more in length must carry at least two lifebuoys. Each lifebuoy must be provided with a self-igniting light and self-activating smoke signals and be capable of quick release from the navigating bridge.(2) At least one other lifebuoy must be provided with a self-igniting light and at least one lifebuoy must be fitted with a buoyant line.(3) Lifebuoys must comply with rule 42A.16).
Lifejackets	<ol style="list-style-type: none">(1) A ship must carry a lifejacket for—<ol style="list-style-type: none">(a) every person that the ship is permitted to carry; and(b) 2 lifejackets for each person on board who maintains a watch.(2) Lifejackets must comply with rule 42A.18, and each lifejacket must have a buoyancy of at least 150 Newtons.(3) Lifejackets must be fitted with a lifejacket light.(4) Lifejackets must be stowed in locations approved by a surveyor and must be readily accessible to persons on board in an emergency. The stowage position of all lifejackets must be clearly and permanently marked.
Line throwing appliance	A ship must carry a line throwing appliance that complies with rule 42A.30.
Immersion suits	For each member of the crew of the rescue boat, an immersion suit must be carried that complies with rule 42A.25 and is of an adequate size.
General emergency alarm	A ship must be provided with a general emergency alarm system that complies with rule 42A.32.
Distress flares	A ship must be provided with 12 rocket parachute flares that comply with rule 42A.22.

3.2 Offshore limit ships and coastal limit ships

The requirements in Appendix 3.2 apply to ships that proceed in the coastal or the offshore limit.

Item	Requirements						
Survival craft (comprising lifeboats, rescue boats and liferafts)	<p>(1) A ship of 30 metres or more in length overall must be provided with either,—</p> <ul style="list-style-type: none"> (a) on each side of the ship, one or more lifeboats of sufficient aggregate capacity to accommodate all persons on board, and liferafts of sufficient aggregate capacity to accommodate all persons on board; or (b) a rescue boat that is capable of being launched on one side of the ship and liferafts, of sufficient aggregate capacity to accommodate twice the number of persons on board. <p>(2) A ship of less than 30 metres but 15 metres or more in length overall must be provided with—</p> <ul style="list-style-type: none"> (a) at least one lifeboat or rescue boat that is capable of being launched on one side of the ship; and (b) liferafts of sufficient aggregate capacity to accommodate all persons on board. <p>(3) A ship of less than 15 metres in length overall must carry at least one liferaft of sufficient aggregate capacity to accommodate all persons on board.</p> <p>(4) If 16 or more persons are carried in a ship, the number of liferafts provided must be at least 2.</p> <p>(5) Liferafts carried must be stowed so that they can be readily placed in the water on either side of the ship.</p> <p>(6) Each lifeboat or rescue boat must be attached to a separate set of davits that complies with rule 42A.28(2). Liferafts must be provided with a hydrostatic or similar automatic release to enable the liferafts to float free if the ship sinks.</p> <p>(7) Lifeboats must comply with rule 42A.6 and 42A.7 where applicable. A liferaft must comply with rules 42A.8 and 42A.9. A rescue boat must comply with rule 42A.15.</p>						
Lifebuoys	<p>(1) A ship of 60 metres or more in length overall must be provided with at least 8 lifebuoys and a ship of less than 60 metres in length overall must be provided with at least 4 lifebuoys but, where the total number of persons carried on the ship is less than 8, at least the following number of lifebuoys must be carried:</p> <table> <tbody> <tr> <td>7 or 8 persons</td> <td>4 lifebuoys</td> </tr> <tr> <td>5 or 6 persons</td> <td>3 lifebuoys</td> </tr> <tr> <td>4 or less persons</td> <td>2 lifebuoys</td> </tr> </tbody> </table> <p>(2) One lifebuoy on each side of the ship must be fitted with a buoyant lifeline. At least 50 percent of the total number of lifebuoys must be provided with self-igniting lights and (on ships greater than 30 metres in length) at least two of the lifebuoys provided with self-igniting lights must also be provided with self-activated smoke signals and be capable of quick release from the navigating bridge.</p> <p>(3) Lifebuoys must comply with rule 42A.16.</p>	7 or 8 persons	4 lifebuoys	5 or 6 persons	3 lifebuoys	4 or less persons	2 lifebuoys
7 or 8 persons	4 lifebuoys						
5 or 6 persons	3 lifebuoys						
4 or less persons	2 lifebuoys						

Lifejackets	<ol style="list-style-type: none">(1) A ship must be provided with a lifejacket for every person that the ship is permitted to carry. Lifejackets must have a buoyancy of 150 Newtons and must comply with rule 42A.18.(2) A lifejacket must be provided for each child carried that is of an appropriate size and that complies with rule 42A.19.
Line throwing appliance	A ship of 30 metres or more in length must be provided with a line throwing appliance that complies with rule 42A.30.
Distress flares	A ship must be provided with 6 rocket parachute flares that comply with rule 42A.22.

3.3 Restricted coastal and restricted limit ships

The requirements of Appendix 3.3 apply to ships that proceed in a restricted coastal limit or restricted limits.

Item	Requirements				
Survival Craft (comprising lifeboats, rescue boats and liferafts)	<p>(1) A ship of 35 metres or more in length overall that operates in a restricted coastal limit must be provided with—</p> <ul style="list-style-type: none"> (a) one or more liferafts, that comply with rules 42A.11 and 42A.12, of sufficient aggregate capacity to accommodate all persons on board and stowed so that they can readily be placed in the water on either side of the ship; and (b) a rescue boat, that complies with rule 42A.15, stowed so that it can readily be placed in the water on one side of the ship. <p>(2) A ship of less than 35 metres in length overall that operates in a restricted coastal limit must be provided with one or more liferafts that comply with rules 42A.11 and 42A.12, of sufficient aggregate capacity to accommodate all persons on board the ship. The liferafts must be stowed so that they can be readily placed in the water on either side of the ship.</p> <p>(3) A ship that does not proceed beyond restricted limits must carry either—</p> <ul style="list-style-type: none"> (a) lifeboats, that comply with rules 42A.6 and 42A.7; or (b) rescue boats, that comply with rule 42A.15; or (c) liferafts, that comply with rules 42A.11 and 42A.12; or (d) buoyant apparatus, that comply with rule 42A.31; or (e) lifebuoys, that comply with rule 42A.17, <p>that, together with the number of lifebuoys required below, are sufficient to support all persons on board the ship.</p> <p>(4) Each lifeboat or rescue boat provided must be attached to davits that complies with rule 42A.28(2).</p>				
Lifebuoys	<p>(1) A ship must be provided with lifebuoys as follows:</p> <ul style="list-style-type: none"> (a) for ships of 24 metres or more in length overall, at least 4 lifebuoys, provided that where the total number of persons carried on the ship is less than 8, at least the following number of lifebuoys must be carried— <table border="0" data-bbox="627 1334 1248 1397"> <tr> <td data-bbox="627 1334 847 1358">7 or 8 persons</td> <td data-bbox="847 1334 1248 1358">4 lifebuoys</td> </tr> <tr> <td data-bbox="627 1358 847 1397">5 or 6 persons</td> <td data-bbox="847 1358 1248 1397">3 lifebuoys</td> </tr> </table>	7 or 8 persons	4 lifebuoys	5 or 6 persons	3 lifebuoys
7 or 8 persons	4 lifebuoys				
5 or 6 persons	3 lifebuoys				

⁴⁰ For example, the means of communication in rule 40C.53(2).

Appendix 4 Radiocommunication equipment

4.1 Ships within a VHF coverage area

The requirements in Appendix 4.1 apply to ships that proceed beyond enclosed waters but do not proceed beyond a VHF coverage area.

Item	Requirements
VHF Radio	A ship must be provided with a VHF radio that complies with rule 43.12. The VHF radio must be so positioned that it is possible to operate the distress alert from the normal navigation position.
Satellite EPIRB	<ol style="list-style-type: none">(1) A ship must be provided with a 406 MHz EPIRB that complies with the requirements of rule 43.18A or 43.19.(2) The EPIRB must be kept in a readily accessible position on board the ship.
Source of electrical power	<ol style="list-style-type: none">(1) A ship must have available at all times while it is at sea a rechargeable battery that is situated above the ship's design waterline and is capable of operating the VHF radio installation. The battery must be of sufficient capacity to supply continuously for a period of at least 6 hours a total current equal to—<ol style="list-style-type: none">(a) the current consumption of the VHF radio receiver; and(b) one-third of the current that may be drawn by the VHF radio transmitter for speech transmission on the frequency at which the current consumption is a maximum; and(c) the current consumption of the emergency electric light, if applicable; and(d) one-third of the current that may be drawn by each additional load capable of operation from this battery.(2) For a ship that spends less than 24 hours at sea at one time, provision must be made for recharging the radio battery system within 10 hours. For a ship that spends more than 24 hours at sea at one time, provision must be made for recharging the radio battery system within 10 hours while the ship is at sea.
Clock	A means of accurately telling the time must be permanently mounted on board.
Card of instructions	A ship must be provided with a suitable card that explains in simple terms the use of the VHF radio and distress procedure.
Emergency electric light	<ol style="list-style-type: none">(1) A ship of 24 metres or more in length overall must be provided with an emergency electric light that—<ol style="list-style-type: none">(a) is independent of the system that supplies the normal lighting of the VHF radio installation; and(b) is permanently arranged so as to be capable of illuminating—<ol style="list-style-type: none">(i) the operating controls of the VHF radio installation; and(ii) the card of instructions; and(c) is controlled by a switch, clearly labelled to indicate its purpose, placed at the operating position of the VHF radio installation.

	(2) A ship of less than 24 metres in length overall must be fitted with the emergency electric light prescribed above or carry a torch for this purpose.
Documents	<p>(1) A ship must carry the following documents:</p> <ul style="list-style-type: none"> (a) a Ship Station Radio Licence issued pursuant to the Radiocommunications (Radio) Regulations 1993; and (b) any associated call sign and MMSI (Maritime Mobile Service Identity) number (if provided). <p>(2) The Ship Station Radio Licence and any call sign or MMSI number must be displayed in the vicinity of the radio installation.</p>

4.2 Ships that proceed beyond a VHF coverage area but not beyond the offshore limit

The requirements in Appendix 4.2 apply to ships that proceed beyond a VHF coverage area but not beyond the offshore limit.

Item	Requirements
MF/HF Radiotelephone	A ship must be provided with a MF/HF Radiotelephone that complies with rule 43.14.
VHF Radio	A ship must be provided with a VHF radio that complies with rule 43.12. The VHF radio must be positioned so that it is possible to operate the distress alert from the normal navigation position.
Satellite EPIRB	<p>(1) A ship must be provided with a satellite EPIRB that is either—</p> <ul style="list-style-type: none"> (a) a 406 Mhz EPIRB that complies with rule 43.19; or (b) an INMARSAT EPIRB that complies with rule 43.20. <p>(2) The EPIRB must be kept in a readily accessible position onboard the ship.</p>
Source of electrical power	<p>(1) A ship must have a main source of electrical power capable of operating the radio installations in the ship.</p> <p>(2) A ship must have available at all times, while at sea, a reserve source of electrical power that is located above the design waterline. This must consist of re-chargeable batteries of sufficient capacity to supply continuously for a period of at least 6 hours a total current equal to the sum of—</p> <ul style="list-style-type: none"> (a) the current required to operate the VHF radio receiver; and (b) one half of the current required to operate the VHF radio transmitter for the transmission of speech, with the transmitter operating at its full rated frequency output power; and (c) the current required to operate the MF/HF radio receiver; and (d) one-half of the current required to operate the MF/HF radio transmitter for the transmission of speech, with the transmitter operating at its full rated radio frequency output power; and (e) the emergency light; and (f) one-third of the current that may be drawn by each additional load capable of operation from this battery. <p>(3) Provision must be made for recharging the radio battery system</p>

	within 10 hours while the ship is at sea.
Clock	A ship must be provided with a reliable accurate clock that is— (a) fully visible to the radio operator; and (b) mounted in the immediate vicinity of the radio installation; and (c) marked with the radiotelephone silence periods.
Card of instructions	A ship must be provided with a suitable card that explains in simple terms the use of the radio equipment and distress procedures to an unskilled person for use in an emergency.
Emergency electric light	(1) A ship of 24 metres or more in length overall must be provided with an emergency electric light that— (a) is independent of the system that supplies the normal lighting of the radio installations; and (b) is permanently arranged so as to be capable of illuminating— (i) the operating controls of the radio installations; and (ii) the clock; and (iii) the card of instructions; and (c) is controlled by a switch, clearly labelled to indicate its purpose, placed at the operating position of the MF/HF radiotelephone. (2) Ships of less than 24 metres in length overall must be fitted with the emergency electric light prescribed above or carry a torch for this purpose.
Documents	(1) A ship must carry the following documents: (a) a Ship Station Radio Licence issued pursuant to the Radiocommunications (Radio) Regulations 1993; and (b) any associated call sign and MMSI (Maritime Mobile Service Identity) number (if provided). (2) The Ship Station Radio Licence and any call sign or MMSI number must be displayed in the vicinity of the radio installation.

4.3 Ships of less than 300 gross tonnage that undertake an international voyage⁴¹

The requirements in Appendix 4.3 apply to ships that are ships of less than 300 gross tonnage and that undertake an international voyage.

Item	Requirements
MF/HF Radiotelephone	A ship must be provided with a MF/HF radiotelephone that complies with rule 43.15.
VHF Radio	A ship must be provided with a VHF radio that complies with rule 43.13. The VHF radio must be positioned so that it is possible to operate the distress alert from the normal navigation position.
Radar Transponder	A ship must be provided with a radar transponder that complies with rule 43.22 and is capable of operating in the 9 GHz band and is stowed so that it can be easily utilised.
Satellite EPIRB	<ul style="list-style-type: none"> (1) A ship must be provided with a satellite EPIRB that is either— <ul style="list-style-type: none"> (a) a 406 MHz EPIRB that complies with rule 43.19; or (b) an INMARSAT EPIRB that complies with rule 43.20. (2) The EPIRB must be kept in a readily accessible position onboard the ship.
Source of electrical power	<ul style="list-style-type: none"> (1) A ship must have a main source of electrical power capable of operating the radio installations in the ship. (2) A ship must have available at all times, while at sea, a reserve source of electrical power that is located above the design waterline. This must consist of re-chargeable batteries of sufficient capacity to supply continuously for a period of at least 6 hours, a total current equal to the sum of— <ul style="list-style-type: none"> (a) the current required to operate the VHF radio receiver; and (b) one half of the current required to operate the VHF radio transmitter for the transmission of speech, with the transmitter operating at its full rated frequency output power; and (c) the current required to operate the MF/HF radio receiver; and (d) one-half of the current required to operate the MF/HF radio transmitter for the transmission of speech, with the transmitter operating at its full rated radio frequency output power; and (e) the emergency light; and (f) one-third of the current that may be drawn by each additional load capable of operation from this battery. (3) Provision must be made for recharging the radio battery system within 10 hours while the ship is at sea.
Clock	<ul style="list-style-type: none"> A ship must be provided with a reliable accurate clock that is— <ul style="list-style-type: none"> (a) fully visible to the radio operator; and (b) mounted in the immediate vicinity of the radio installation; and (c) marked with the radiotelephone silence periods.
Card of instructions	A ship must be provided with a suitable card that explains in simple terms the use of the radio equipment and distress procedures to an unskilled person for use in an emergency.
Emergency electric light	<ul style="list-style-type: none"> (1) A ship must be provided with an emergency electric light that—

⁴¹ Ships of 300 tons or more but less than 500 tons gross tonnage that undertake an international voyage, are SOLAS convention ships for radio installation purposes only and must meet the requirements of rule 40B.23.

	<ul style="list-style-type: none">(a) is independent of the system that supplies the normal lighting of the radio installations; and(b) is permanently arranged so as to be capable of providing sufficient illumination of—<ul style="list-style-type: none">(i) the operating controls of the radio installations; and(ii) the clock; and(iii) the card of instructions; and(c) is controlled by a switch, clearly labelled to indicate its purpose, placed at the operating position of the MF/HF.
Documentation	<ul style="list-style-type: none">(1) A ship must carry the following documents:<ul style="list-style-type: none">(a) a Ship Station Radio Licence issued pursuant to the Radiocommunications (Radio) Regulations 1993; and(b) any associated call sign and MMSI number (if provided); and(c) a list of radio stations of countries that are to be visited; and(d) an International Telecommunications Union manual for use in the Maritime Mobile and the Maritime Mobile Satellite service.(2) The Ship Station Radio Licence and any associated call sign and MMSI number must be displayed in the vicinity of the radio installation.

Rule 40C.9(6)

Appendix 5 Inflatable and rigid-inflatable boats

1. Inflatable boats

- (1) If a surveyor assigns inshore limits to an inflatable boat under rule 20.5, the owner and master of the boat must ensure that it—
 - (a) remains within 20 miles of a safe haven; and
 - (b) operates only in favourable weather.
- (2) An inflatable boat must comply with the requirements of the International Standard ISO 6185:1982 Shipbuilding and Marine Structures – Inflatable Boats – Boats made of reinforced elastomers or plastomers, or substantially comply with that standard to the satisfaction of the Director.

2. Rigid – inflatable boats

- (1) A surveyor must not assign coastal limits (including restricted coastal limits) to a rigid-inflatable boat unless—
 - (a) it is purpose designed for the carriage of persons; and
 - (b) it has a substantial enclosure for persons.
- (2) If a surveyor assigns coastal limits to an inflatable boat under rule 20.5, the owner and master of the boat must ensure that it remains within 60 miles of a safe haven.
- (3) Inflatable portions of rigid-inflatable boats must be constructed of materials of—
 - (a) sufficient tensile and tear strength; and
 - (b) sufficient resistance,

to withstand the environmental and abrasive conditions that may be expected in the service in which the boat is to be operated.
- (4) The rigid hull of a rigid inflatable ship must be constructed of wood, fibre reinforced plastic, aluminium alloy or steel.
- (5) The location of the inflatable portions relative to the hull must be such as to minimise loads on the inflatable portions, particularly when the boat is pounding into a sea.
- (6) The design and detail of the attachment of the inflatable portions to the rigid hull, particularly in the bow region where the greatest loads occur, must be adequate for the conditions that may be expected in the service in which the boat is to be operated.
- (7) Where the inflatable portions are bonded to the rigid hull, the attachment design must be such that the principal loads are taken in shear rather than in peel.
- (8) Where the inflatable portions are mechanically fastened to the hull, the attachment design must be consistent with the service loads to which the inflatable portion is subjected, and must minimise any chafing of the inflatable portion fabric and connections to that fabric.
- (9) Where the inflatable portions are necessary in order for the boat to meet the buoyancy and stability requirements of this Appendix, the inflatable portions must consist of the minimum total number of separate compartments shown in Table 40C.8, if no compartment exceeds 60 percent of the total volume.

Table 40C.8

Maximum Permissible Power	LxB	
	5 to 9	Greater than 9
10hp to 25hp	2	3
Greater than 25hp	3	4

Where L = length in metres
 B = breadth in metres

- (10) Each inflatable compartment required by clause 2(9) must be fitted with a non-return valve for manual inflation and a means of deflation. A pressure relief valve must also be fitted unless a surveyor is satisfied that this is unnecessary.
- (11) Where a transom is fitted, it must not be inset by more than 20 percent of the boat's length from aft.
- (12) A boat operating outside enclosed waters must meet the requirements of rule 40C.16.
- (13) An open boat that in the opinion of a surveyor has inadequate sheer forward must have a raised spray cover, to deflect water, over not less than 15 percent of the boat's length forward.
- (14) Vulnerable places on the outside of the inflatable portions should be provided with rubbing strips to the satisfaction of a surveyor.
- (15) Suitable patches must be provided for securing any fittings to the inflatable portions.
- (16) Buoyancy, stability, freeboard and passenger numbers for rigid inflatable boats which—
 - (a) are less than 12 metres in length over all; and
 - (b) carry 12 or less persons; and
 - (c) are not fitted with decks above the hull to which persons have access, must be determined in accordance with the requirements of Annex 1 to this Appendix.
- (17) For rigid inflatable boats that—
 - (a) are 12 metres or more in length overall; or
 - (b) carry more than 12 persons; or
 - (c) are fitted with decks above the hull to which persons have access

the intact stability requirements of Appendix 1 for a single hull ship carrying more than 12 persons must be applied. Further, it must be shown that the boat with the entire buoyancy on one side deflated has sufficient residual stability, that—

 - (d) any angle of equilibrium does not exceed 7 degrees from the upright; and
 - (e) the resulting righting lever curve has a range to the downflooding angle⁴² of at least 15 degrees beyond any angle of equilibrium; and
 - (f) the maximum righting lever within the range is not less than 100 mm; and
 - (g) the area under the curve is not less than 0.015 metre radians.

⁴² The downflooding angle is to be taken as the angle at which there is zero freeboard at any part of the damaged boat.

(18) Safety equipment must be provided in accordance with the requirements of Appendices 3 and 4. In addition, for boats proceeding more than 5 miles from a safe haven, the following must be carried, unless the buoyancy and stability required by this Appendix for the boat can be achieved without the inflated portions:

- (a) for repairing punctures, a repair kit in a suitable container;⁴³ and
- (b) an efficient manually operated bellows or pump.

⁴³ It is recommended that a clamp type repair kit be carried on rigid inflatable boats.

Annex 1 Tests to be carried out on inflatable and rigid-inflatable boats

The following tests must be carried out on a boat floating in still water and observed by a surveyor:

(1) Stability tests

- (a) The tests must be carried out with the engine and fuel tank fitted or replaced with an equivalent mass, and each person may be substituted by a mass of 75 kgs for the purpose of the tests.
- (b) The maximum number of persons to be carried on the boat must be crowded to one side, with half this number seated on the buoyancy tube. This procedure must be repeated with the persons seated on the other side and at each end of the boat. In each case buoyancy must be positive and a surveyor must record the freeboard to the top of the buoyancy tube.
- (c) Two persons on board the boat must recover a third person from the water into the boat. The third person must feign unconsciousness and have his or her back towards the boat so as not to assist the rescuers. The stability of the boat must remain positive throughout the recovery.⁴⁴.

(2) Damage tests

- (a) Damage tests should be carried out with the boat loaded with the maximum number of persons to be carried on the boat. The engine and fuel tank with full fuel must be fitted, or replaced by an equivalent mass, and all equipment appropriate to the intended use of the boat must be fitted.
- (b) Tests witnessed by a surveyor must be for the following conditions of simulated damage—
 - (i) with the forward buoyancy compartment deflated; and
 - (ii) with the entire buoyancy on one side of the boat deflated.

The tests are successful if, for each condition of simulated damage, the maximum number of persons to be carried is supported within the boat.

(3) Swamp test

- (a) It must be demonstrated that an open or partially open boat, when fully swamped, is capable of supporting its full outfit of equipment, the maximum number of persons to be carried on the boat and a mass equivalent to its engine and full tank of fuel.
- (b) In the swamped condition, the boat must not be seriously deformed.
- (c) The boat's drainage system must be demonstrated at the conclusion of the test.

(4) Freeboard test

Subject to 5(b), the freeboard of a post-27 May 2004 boat must not be less than—

- (a) 300 mm or one-half the buoyancy tube diameter, whichever is the larger, measured from the upper surface of the buoyancy tubes; and
- (b) 250 mm at the lowest part of the transom;

with the boat in the following conditions:⁴⁵

- (c) carrying all its equipment, engine and a full fuel load, provided that any or all of these may be replaced with an equivalent mass; and
- (d) carrying all its equipment, engine and a full fuel load and the maximum number of persons permitted to be carried, provided that any or all of these may be replaced with an equivalent

⁴⁴ Each person involved should wear an appropriate lifejacket during this test.

⁴⁵ Where fitted, drainage socks may be tied up for this test.

mass (for persons, an average individual mass of 75 kgs must be used), with the boat trimmed as necessary to represent a normal operating condition.

(5) *New and existing boats*

- (a) Pre and post 27 May 2004 boats must be subject to the above tests, provided that for standard production types, a surveyor may accept documented evidence of tests of the prototype witnessed by a surveyor. Such documentation must be for a prototype with the same or a greater number of persons, and similar motor, fuel and equipment or greater specification.
- (b) In the case of a pre-27 May 2004 boat that is unable to meet the minimum freeboards of (4), a surveyor may consider a lesser 'operational freeboard' taking into account the safe operational history of the boat in the operating limits and type of service provided.

Rules 40C.54-57, 40C.83.

Appendix 6 Anchors and chain cables

Table 1

Anchors and chain cables for ships of 24 metres or more in length

Equipment Numeral		Stockless Anchors		Stud Link Chain Cable		
Exceeding	Not Exceeding	Number	Weight per Anchor (Kgs)	Total Length (m)	Mild Steel Dia (mm)	Special Steel Dia (mm)
50	60	2	120	192.5	12.5	—
60	70	2	140	192.5	12.5	—
70	80	2	160	220	14	12.5
80	90	2	180	220	14	12.5
90	100	2	210	220	16	14
100	110	2	240	220	16	14
110	120	2	270	247.5	17.5	16
120	130	2	300	247.5	17.5	16
130	140	2	340	275	19	17.5
140	150	2	390	275	19	17.5
150	175	2	480	275	22	19
175	205	2	570	302.5	24	20.5
205	240	2	660	302.5	26	22
240	280	2	780	330	28	24
280	320	2	900	357.5	30	26
320	360	2	1020	357.5	32	28
360	400	2	1140	385	34	30
400	450	2	1290	385	36	32
450	500	2	1440	412.5	38	34
500	550	2	1590	412.5	40	34
550	600	2	1740	440	42	36
600	660	2	1920	440	44	38
660	720	2	2100	440	46	40

Table 2(A)

Anchor weights (Kgs) for ships operating in offshore waters

L	H													
	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
8	12	15	18.5	21	24.5	27	31	35						
9	14	17	21	24	28	32	36	41	46					
10	16	19	23.5	27	32	37	42	47	52	59				
11	18	22	26	31	37	42	48	54	61	67.5	75			
12	20	24.5	29	35	41	48	54	62	69.5	77	87	96		
13	22	27	33	40	46.5	53.5	62	70	80.5	90	99.5	110	121	
14	24	30.5	37.5	45	52	61	70	81	91	102	113	124.5	138	148
15	27	35	42	50	59	69	79	91	102	115	128	141	154	167.5
16	31	39	47	56	66	77	90	102	115	129	142	156	171	186
17	35	43	52	63	74	87	100	114	129	143	158	174	190	206
18	39	48	58	70	83	97	111	127	142	158	175	191	210	226
19	43	53	65	78	93	108	124	140	156	175	192	211	227.5	246
20	48	59	72	87.5	103	120	137	154	172.5	191	211	229	248	268
21	53	66	80	97	114	132	149	169	189	208	228	248	269.5	291
22	59	73	90	107	126	144.5	164	185	206	226	247	269.5	292	318
23	65	82	100	118	138	158	180	201	223	244	268	291	318	347
24	72	90	109	130	150	172	195	218	240	264	289	318	343.5	388

Table 2(B)
Anchor weights (Kgs) for ships operating in coastal and inshore waters

L	H													
	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
4			7	10										
5		7	10	12	14									
6	7	10	12	13	15	18								
7	9	11	14	16	18	20	22.5							
8	10	12.5	15	17.5	20	22.5	25	30						
9	12	15	17.5	20	22.5	27.5	30	35	40					
10	14	17	20	22.5	27.5	30	35	40	45	50				
11	15	20	22.5	25	30	35	40	45	50	55	60			
12	17	20	25	30	35	40	45	50	57.5	65	72.5	80		
13	20	25	30	35	40	45	50	60	67.5	75	82.5	90	100	
14	20	25	32.5	37.5	45	50	57.5	67.5	75	85	95	105	115	125
15	22.5	30	35	42.5	50	57.5	65	75	85	95	110	120	130	140
16	25	32.5	40	47.5	55	65	75	85	97.5	110	120	130	140	155
17	30	37.5	45	52.5	62.5	72.5	85	95	110	120	130	145	160	175
18	32.5	40	50	60	70	80	92.5	105	120	130	145	160	175	190
19	35	45	55	65	77.5	90	105	120	130	145	160	175	190	205
20	40	50	60	72.5	85	100	115	130	145	160	175	190	205	225
21	45	55	67.5	80	95	110	125	140	160	175	190	210	225	245
22	50	60	75	90	105	120	135	155	175	190	205	225	245	265
23	55	70	85	100	115	130	150	170	190	205	225	245	265	290
24	60	75	90	110	125	145	165	180	200	220	240	260	285	320

Table 2(C)
Anchor weights (Kgs) for ships operating in enclosed waters only

L	H													
	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
4			6	8										
5		6	8	9.5	11									
6	6	8	9.5	11	12.5	14								
7	7	9	11	12.5	14.5	16	18							
8	8	10.5	12.5	14.5	16.5	18.5	21	23.5						
9	9.5	12	14	16.5	18.5	21.5	24.5	28	31					
10	11	13	16	18.5	21.5	25	28.5	32	35	40				
11	12.5	15	18	21	24.5	28.5	32.5	36	41	45.5	50			
12	13	16.5	20	23.5	28	32.5	36.5	42	46	52	58	64		
13	15	18.5	22.5	27	31.5	36	42	47	53	60	66	73	81.5	
14	17	20.5	25	30.5	35	41.5	47	53	60.5	68	74.5	84.5	<u>92</u>	99
15	19	23	29	33.5	40	46	53	60.5	68	77	86	<u>94</u>	103	112
16	21	26	32	37.5	44.5	51.5	59.5	68	77	87	<u>95.5</u>	104.5	114.5	125
17	23	30.5	35	42.5	49	58	66.5	76	87	<u>95.5</u>	105	116.5	127	138
18	26.5	32.5	39	47	55.5	64.5	74.5	85.5	<u>96</u>	105	117	128.5	140	151
19	29	36	44	52	62	72	83.5	<u>96</u>	106	117	129	141	153	164
20	32.5	40	48	58.5	68.5	81	<u>92</u>	104	115	128	141	153.5	166	180
21	35.5	44.5	53.5	64.5	76	88.5	<u>100</u>	113	126	138	153	166.5	181	195
22	40	49	60	71.5	85	<u>96.5</u>	111	124	138	152	165	181	195.5	211
23	44	54	66.5	79	<u>93</u>	106	120	135	149	163	180	195	211	230
24	48	60.5	73	88	<u>100</u>	116	131	146	162	175	196	210	229	250

Notes relating to Table 2(A), 2(B) and 2(C)

1. L is the ship's overall length in metres and H is the height in metres shown in Figure 4.1.
2. Above the underlined figures in Table 2, one anchor is required. Below the heavy line, two anchors are required.
3. The weight of anchor is for a ship having a displacement hull. For ships having a planing hull, the weight of anchor in Table 2 may be reduced by 25 percent.
4. The weights given are for stockless anchors with an assumed holding power of 3 times their weight. Where recognised high holding power anchors are carried, a reduction of 30 percent of the specified anchor weight may be permitted. Recognised high holding power anchors are those anchors having a holding power at least double that of stockless anchors.
5. Where a ship is required to carry two anchors of a specified weight, any one anchor may differ by not more than 10 percent from such specified weight, but the total weight of both anchors carried must not be less than twice the specified weight.
6. The weight of the head of a stockless anchor must be at least 60 percent of the total weight of the anchor.

Table 3(A)
Anchor cables — ships operating in offshore and coastal waters

	Anchor Weight (Kgs)	Short link chain dia (mm)	Manila rope dia (mm)	Terylene rope dia (mm)	Nylon rope dia (mm)	Plus chain pendant length
Rope may be used instead of chain	Under 8 8-13	8 8	14 16	12 12	10 10	3m chain
	13-18	8	18	14	11	
	18-25	8	20	16	12	
One chain must be carried. Rope may be substituted for chain on second anchor.	25-32	10	24	16	14	6m chain
	32-38	10	24	18	14	
	38-44	10	24	22	16	
	44-51	13	30	24	18	
	51-76	14	34	28	20	
	76-89	14	38	32	22	
	89-100	15	40	34	24	
Rope not permitted	100-130	15				
	130-178	16				
	178-226	17				
	226-274	19				
	274-322	20				
	322-370	21				
	370-432	21				

Table 3(B)
Anchor cables — ships operating in restricted limits

	Anchor weight (kgs)	Short link chain dia (mm)	Manila rope dia (mm)	Terylene rope dia (mm)	Nylon rope dia (mm)	Chain pendant length
Rope may be used in lieu of chain	Under 8	8	14	12	10	3m chain
	8-13	8	16	12	10	
	13-18	8	18	14	11	
	18-25	8	20	16	12	
	25-38	10	24	18	14	6m chain
	38-44	12	24	22	16	
	44-51	13	28	24	18	
	51-89	14	36	30	22	
	89-100	15	40	34	24	
One chain must be carried. Rope may be substituted for chain on second anchor	100-130	15	48	40	30	9m chain
	130-178	16	52	46	34	
	178-226	17	56	48	36	
	226-274	19	60	52	38	

Notes relating to Table 3(A) and 3(B)

1. The chain pendant must be of the table size for short link chain and shackled between rope and anchor.
2. Where a higher holding power anchor is permitted (see Notes, Tables 2(A), 2(B) and 2(C)), the chain or rope used must be that nominated for the weight of the stockless anchor for which the high holding power is specified.
3. For small high holding power anchors, the use of nylon is recommended because of its greater elasticity and breaking strain compared to manila.
4. Where anchor ropes are permitted instead of chain, the use of a chain pendant of tabulated size and length is mandatory. This chain facilitates the anchor shank assuming a horizontal position, hence maximising the holding power of the anchor.

Table 4

Length of anchor cable to be carried

Length overall of ship (metres)	Length of Cable per Anchor (metres)
4-6	See Notes
7-9	45
10-11	55
12-14	70
15-17	82
18-20	96
21-24	110

Notes relating to Table 4

For ships of less than 7 metres in length overall, a surveyor must have regard to the ship arrangements, and area and nature of operation of the ship in determining the appropriate length of cable to be provided.

Figure 9.1

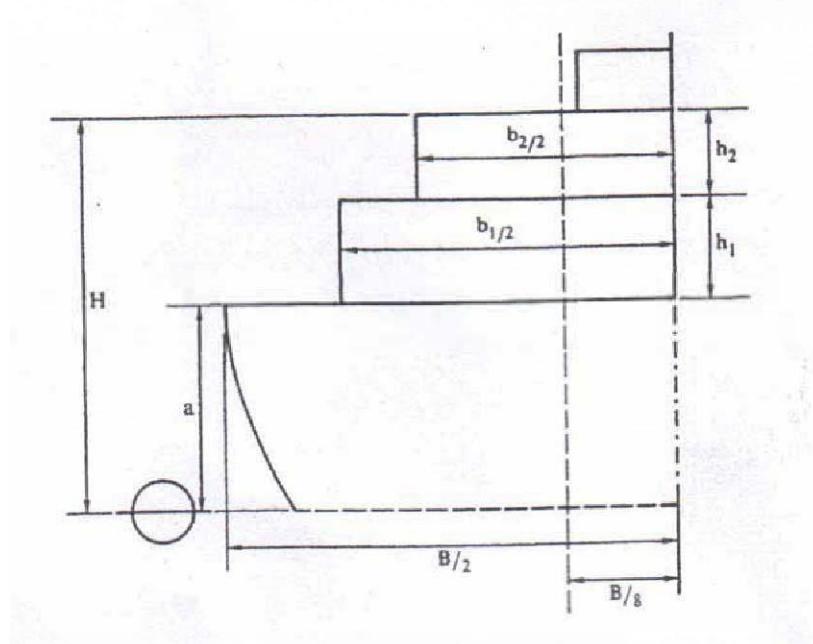


Table 5
Anchors and chain cables for barges

Equipment Numeral	Stockless Anchors		Stud Link Chain Cable		
	Number	Weight per Anchor (kgs)	Total Length (metres)	Mild Steel Dia (mm)	Special Steel Dia (mm)
30	2	80	165	11	
40	2	100	195	11	
50	2	120	195	12.5	
60	2	140	195	12.5	
70	2	160	220	14	12.5
80	2	180	220	14	12.5
90	2	210	220	16	14
100	2	240	220	16	14
110	2	270	250	17.5	16
120	2	300	250	17.5	16
130	2	340	275	19	17.5
140	2	390	275	19	17.5
150	2	480	275	22	19
175	2	570	305	24	20.5
205	2	660	305	26	22
240	2	780	330	28	24
280	2	900	360	30	26
320	2	1020	360	32	28
360	2	1140	385	34	30
400	2	1290	385	36	32
450	2	1440	415	38	34
500	2	1590	415	40	34
550	2	1740	440	42	36
600	2	1920	440	44	38

Notes relating to Table 5

1. Anchors are of the ordinary stockless type. Where a recognised high holding power type is provided, the weight may be reduced, with a surveyor's approval, by 25 percent.
2. A surveyor may permit the table length of chain cable to be reduced by up to 50 percent for barges that operate in restricted limits only and manned barges.
3. Where the equipment numeral is less than 110, unstudded short link chain may be used instead of stud link chain, if the unstudded short link chain has a breaking strength of not less than that of the required stud link chain.