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SOLOMON ISLANDS GOVERNMENT MINISTRY OF INFRASTRUCTURE  
AND DEVELOPMENT

MARINE DIVISION

SHIPPING (NON CONVENTION VESSEL SAFETY) REGULATIONS 2006

In exercise of powers conferred by section 220 and section 92 of the Shipping Act, 19  
(no. 5 of 1998)

**THE SHIPPING ACT 1998  
(No. 5 of 1998)**

**THE SHIPPING (NON CONVENTION VESSEL SAFETY)  
REGULATIONS 2006**

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**THE SHIPPING ACT 1998**

**(Section 92)**

**(No. 5 of 1998)**

**SHIPPING (NON CONVENTION VESSEL SAFETY) REGULATIONS**

IN exercise of the powers conferred by sections 220 and 92 of The Shipping Act 1998, I, STANLEY SOFU, Minister for Infrastructure and Development, do hereby make the following regulations -

**PART I**

**General Provisions**

1. These Regulations may be cited as the Shipping (Non-Convention Vessel Safety) Regulations 2006 and shall be deemed to have come into force on the FIRST DECEMBER 2006.
2. (1) The Safety Regulations for Non-Convention Vessels in Solomon hereinafter called the Regulations take into account the provisions of the following International Conventions:
  - (a) The International Convention for the Safety of Life at Sea (SOLAS), 1974 as amended;
  - (b) The International Convention on Load Lines (LL), 1996, as amended;
  - (c) The International Regulations for Preventing Collisions at Sea (COLREG), 1972, as amended;
- (2) The Regulations shall apply to all vessels and barges as follows

Type of vessel	Applicable Parts
New cargo vessels 15m and above in length and less than 500 gross tonnage, propelled by mechanical means	I to XIII inc.
New cargo-passenger vessels 15m and above in length and less than 500 gross tonnage, propelled by mechanical means	I to XIII inc.
New passenger vessels 15m and above in length and less than 500 gross tonnage, propelled by mechanical means	I to XIII inc.
New manned barges 24m and above in length	I to IV inc., VI to X inc., XI
New manned barges 15m and above in length and less than 24m in length	I, II, XII, and XIII
New unmanned barges 24m and above in length	I to IV inc., XII and XIII
New unmanned barges 15m and above in length and less than 24m in length	I, II, XII and XIII
New Fishing vessels	I to XIII inc.
Existing vessels and barges	As determined by the adm station

- (3) The application of ~~Chapter~~ 7, 8 and 9 to manned barges shall be as determined by the Administration.
- (4) The application of the Regulations to accommodation barges shall be as determined by the Administration.
- (5) The provisions of the Regulations shall not apply to:
- (a) ships of war and troop ships;
  - (b) vessels and barges less than 15(10)metres in length;
  - (c) pleasure craft not engaged in any activity with pecuniary benefits;
  - (d) fishing vessels; and
  - (e) wooden vessels of traditional build
- (6) All existing vessels shall, as a rule, comply with the requirements existing prior to coming into force of the Regulations. Where no such requirements are applicable, vessels shall comply with the Regulations to the extent the Administration considers to be reasonable and practicable. Existing vessels, which undergo replacement of equipment or outfitting related thereto, shall comply with the requirements specified in this Chapter as far as it is considered reasonable and practicable by the Administration.
- (7) Compliance of a vessel with the provisions of the Australian National Standard for Commercial Vessels, as amendments are from time to time adopted, shall be equivalent to compliance with the relevant provisions of the Regulations.
- (8) Unless expressly provided otherwise, the Regulations apply to vessels that are new vessels, as defined, on or after the date of entry into force of the Regulations and to vessels entering Solomon Islands waters and/or applying for registration in accordance with the provisions of the Shipping Act 1998 after the date of entry into force of the Regulations.
- (9) In relation to vessels that comply with the provisions of the Australian National Standard for Commercial Vessels in lieu of compliance with the Regulations, the applicable provisions of the Australian National Standard for Commercial Vessels relating to construction and machinery are those in force on the date on which the keel was laid or on which the vessel was at a similar stage of construction. In relation to equipment requirements, the Administration may refer to the requirements of amendments to the Australian National Standard for Commercial Vessels subsequent to the above date if it so decides.

(10) In relation to a vessel that is permitted by the Administration to comply with the provisions of any other national or international standards in lieu of compliance with the Regulations, the applicable provisions of such standards relating to construction and machinery are those in force on the date on which the keel was laid or on which the vessel was at a similar stage of construction. In relation to equipment requirements, the Administration may refer to the requirements of amendments to such standards subsequent to the above date if it so decides.

(11) For the purpose of application of relevant schedules to the Regulations, or where an Administration permits a vessel to comply with the applicable provisions of the Australian National Standard for Commercial Vessels in lieu of compliance with the Regulations, the following table provides guidance on the equivalence of sea areas adopted for the purpose of the Regulations and operational areas adopted for the purpose of these Regulations.

Sea Area	NSCV Operational Area	NSCV vessel class
Inshore (Inner Island)	within 12n miles of the coast	Class B or Class A*
Near-Coastal (Outer Island)	within 200n miles of the coast	Class A

\*To be decided by the Administration on a case-by-case basis depending on the ship's operational profile.

(12) Where an existing vessel is registered under the flag of Solomon Islands for the first time the Administration may require the vessel and its equipment to comply with all or part of the Regulations as if it was a new vessel.

(13) Where the Administration certifies that a high speed craft, as defined in IMO resolution MSC.36(63) "*International Code of Safety for High Speed Craft*" (HSC Code), complies with the requirements of that Code, or would comply if the route on which it is engaged were an international voyage, the craft shall be deemed to comply with the requirements of Parts III to IX inclusive and Parts XII and XII provided the craft is constructed and maintained in accordance with the requirements of a classification society authorized by the Administration and the certificates and permits issued under the HSC Code shall have the same force and the same recognition as certificates issued under the provisions of Part II.

(14) A passenger submersible complying with the requirements of the IMO "*Guidelines for the design, construction and operation of passenger submersible craft*" shall be deemed to comply with the requirements of the Regulations.

(15) As a guide to Administrations in the application of these Regulations, the following table provides an approximate relationship between length and gross tonnage:

Length	15m	24m	35m	45m
Equivalent gross tonnage	20	150	300	500

3. For the purpose of the Regulations, unless expressly provided otherwise:

“**Accommodation spaces**” are those spaces used for public spaces, corridors, lavatories, cabins, offices, hospitals, cinemas, games and hobbies room, pantries containing no cooking appliances and similar spaces;

“**Administration**” means the Ministry of Transport, Works and Communication or each successor Ministry of Solomon Islands responsible for administration of the safety of maritime transportation;

“**Amidships**” is at the middle of the length (L);

“**Anniversary date**” means the day and month of each year which corresponds to the date of expiry of the relevant certificate;

“**Approved**” means approved by the Administration;

“**Area of operation**” is defined as the following:

“**Inshore**” means within 12 nautical miles of the coast of Solomon Islands

“**Near-Coastal**” means within 200 nautical miles of the coast of Solomon Islands.

“**Assembly station**” is the area of the vessel in which passengers and crew are assembled before moving to the embarkation station preparatory to embarking on life-saving appliances and was formerly known as “muster station”;

“**Assigned freeboard**” the distance calculated in accordance with Part XII, measured vertically downwards amidships from the upper edge of the deck line to the upper of the load line;

“**Australian National Standard for Commercial Vessels**” means the National Standard for Commercial Vessels adopted by the body of Commonwealth, State and Territory Ministers known as the Australian Transport Council, as it is amended from time to time;

**“Auxiliary means of steering”** is the equipment other than any part of the main steering gear necessary to steer the vessel in the event of failure;

**“Barge”** means a cargo vessel not propelled by mechanical means and includes manned and unmanned barges and pontoons, but excludes accommodation barges;

**“Block Coefficient ( $C_b$ )”** is given by the formula  $C_b = V / (L \cdot B \cdot d_1)$ ; where:  
 $V$  is the volume of the moulded displacement of the vessel, excluding bossings, in a vessel with a metal shell, and is the volume of displacement to the outer surface of the hull in a vessel with a shell of any other material, both taken at a moulded draught of  $d_1$ ; where  $d_1$  is 85 per cent of the least moulded depth;  
 $L$  and  $B$  are respectively the length and breadth as defined;

**“Bulkhead deck”** is the uppermost deck up to which the transverse watertight bulkheads are carried;

**“Cargo vessel”** is any vessel, which is not a passenger vessel and is not a cargo-passenger vessel;

**“Cargo-passenger vessel”** is a cargo vessel that is approved by the Administration to carry more than twelve passengers on identified services and that meets safety requirements set out in the Regulations for that type of ship and such other safety requirements specified by the Administration as are deemed necessary to provide a satisfactory level of safety;

**“Cargo spaces”** are all spaces used for cargo (including cargo oil tanks) and trunks to such spaces;

**“Classification society”** means an organization recognized by the Administration for the purpose of conducting inspections and surveys in accordance with regulation 16 (1) on behalf of the Administration;

**“COLREG”** means the International Regulations for Preventing Collisions at Sea, 1972, as amended;

**“Company”** means the owner of the vessel or organization or person such as the manager or bareboat charterer, who has assumed the responsibility for operation of the vessel from the vessel's owner and who on assuming such responsibility has agreed to take over all the duties

and

responsibility imposed by the International Safety Management (ISM) Code (Res. A.741(18)) or other safety management standard accepted by the Administration as providing, to the extent reasonable and practicable, a level of safety of operation equivalent to that of the ISM Code;



**"Continuous watchkeeping"** means that the radio watch concerned shall not be interrupted other than for brief intervals when the vessel's receiving capability is impaired or blocked by its own communication or when the facilities are under periodical maintenance or checks;

**"Control stations"** are those spaces in which the vessel's radio or main navigating equipment or the emergency source of power is located or where the fire alarm, detection or control equipment is centralized;

**"Depth for freeboard (D)"** means the moulded depth amidships, plus the thickness of the freeboard deck stringer plate, where fitted, plus  $T(L-S)/L$  if the exposed freeboard deck is sheathed, where:  
 L is the length as defined;  
 T is the mean thickness of the exposed sheathing clear of deck openings, and  
 S is the total length of superstructures as defined; or;

**"Depth for freeboard (D)"**, in a vessel having a rounded gunwale with a radius greater than 4 per cent of the breadth (B) or having topsides of unusual form, is the depth for freeboard of a vessel having a midship section with vertical topsides and with the same round of beam and area of topside section equal to that provided by the actual midship section;

**"Digital selective calling (DSC)"** means a technique using digital codes which enables a radio station to establish contact with, and transfer information to, another station or group of stations, and complying with the relevant recommendations of the International Radio Consultative Committee;

**"Existing vessel"** means a vessel, which is not a new vessel;

**"Emergency source of electrical power"** is a source of electrical power intended to supply the emergency switchboard in the event of failure of the supply from the main source of electrical power;

**"Fishing Vessel"** is a vessel used for catching fish, whales, seals or other living resources of the sea;

**"Freeboard deck"** means, normally, the uppermost complete deck exposed to weather and sea, which has permanent means of closing all openings in the weather part thereof, and below which all openings in the sides of the vessel are fitted with permanent means of watertight closing. In a vessel having a discontinuous freeboard deck, the lowest line of the exposed deck and the continuation of that line parallel to the upper part of the deck is taken as the freeboard deck. At the option of the owner and subject to the approval of the Administration, a lower deck may be designated as

the freeboard deck provided it is a complete and permanent deck continuous in a fore and aft direction, at least between the machinery space and peak bulkheads, and continuous athwartships. When this lower deck is stepped the lowest line of the deck and the continuation of that line parallel to the upper part of the deck is taken as the freeboard deck. When a lower deck is designated as the freeboard deck that part of the hull which extends above the free board deck is treated as a superstructure so far as concerns the application of the conditions of assignment and the calculation of freeboard. It is from this deck that the freeboard is calculated;

**“Gross tonnage”** means the tonnage as measured in accordance with the International Tonnage Convention, 1969 of the Shipping (Tonnage Measurement) Regulations, as appropriate;

**“Landing barge”** means a self-propelled vessel having its cargo loaded through the bow via a hinged ramp which, when raised, forms the forward structure of the vessel;

**“Length (L)”**, measured in metres, is 96 per cent of the total length on a waterline at 85 per cent 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, whichever is greater. In vessels designed with a rake of keel the waterline on which this is measured shall be parallel to the designed waterline;

**“Load Line Convention”** means the International Convention on Load Lines, 1966, as amended;

**“Low flame spread”** means that the surface thus described will adequately restrict the spread of flame, being determined to the satisfaction of the Administration by an established test procedure;

**“Machinery space”** is to be taken as extending from the moulded base line to the margin line and between the extreme main transverse watertight bulkheads bounding the spaces containing the main and auxiliary propulsion machinery and boilers serving the needs of propulsion. In the case of unusual arrangements, the Administration may define the limits of the machinery spaces;

**“Main machinery spaces”** are those spaces and trunks to such spaces, which contain:  
internal combustion machinery used for main propulsion;  
internal combustion machinery used for purposes other than main propulsion where such machinery has in the aggregate a total power output of not less 375 kW; or  
any oil-fired boiler or oil fuel unit;

**“Main source of electrical power”** is a source intended to supply electrical power to the main switchboard for distribution to all services necessary for maintaining the vessel in normal operational and habitable condition;

**“Main switch board”** is a switchboard which is directly supplied by the main source of electrical power and is intended to distribute electrical energy to the vessel's services;

**"Margin line"** is a line drawn at least 76mm below the upper surface of the bulkhead deck at side;

**"Maritime safety information"** means navigational and meteorological warnings, meteorological forecasts and other urgent safety related messages broadcast to ships;

**"Moulded depth"** is the vertical distance measured from the top of the keel to the top of the freeboard deck beam at side in accordance with the following: in wood and composite vessels the distance is measured from the lower edge of the keel rabbet; where the form at the lower part of the midship section is of a hollow character, or where thick garboards are fitted, the distance is measured from the point where the line of the flat of the bottom continued inwards cuts the side of the keel; in vessels having rounded gunwales, it shall be measured to the point of intersection of the moulded lines of the deck and side shell plating, the lines extending as though the gunwale were of angular design; where the freeboard deck is stepped and the raised part of the deck extends over the point at which the moulded depth is to be determined, it shall be measured to a line of reference extending from the lower part of the deck along a line parallel with the raised part;

**"New vessel"** means a vessel the keel of which is laid or which is at a similar stage of construction on or after the date of adoption of the Regulations;

**"Non-combustible material"**, is a material which neither burns nor gives off flammable vapours in sufficient quantity for self-ignition when heated to approximately 750°C this being determined to the satisfaction of the Administration by an established test procedure. Any other material is a combustible material;

**"Non-Convention vessel"** means a vessel or barge not covered by the international conventions listed in regulation 2 because it is under the minimum size for the application of a convention or is engaged on voyages that are not international voyages within the meaning of a Convention;

**"Offshore supply vessel"** means a vessel, which is: primarily engaged in the transport of stores, material and equipment to offshore installations; and designed with accommodation and bridge erections in the forward part of the vessel and an exposed cargo deck in the after part for the handling of cargo at sea;

**"Oil fuel unit"** is the equipment use 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/mm<sup>2</sup>.

**"Organization"** means the International Maritime Organization;

- "Passenger"** is every person carried on board a vessel with the knowledge of the owner or master of the vessel but does not include the master and the members of the crew or other persons employed or engaged in any capacity on board a vessel on the business of that vessel and does not include shipwrecked, distressed or other persons the carriage of which neither the master nor the owner could have reasonably prevented or forestalled;
- "Passenger vessel"** is a vessel that is approved by the Administration to carry **more than twelve passengers** and that is not a cargo-passenger vessel;
- "Perpendiculars"**, means the forward and after perpendiculars taken at the forward and after ends of the length (L). The forward perpendicular shall coincide with the foreside of the stem on the waterline on which the length is measured;
- "Public spaces"** are those portions of the accommodation, which are used for halls, dining rooms, lounges and similar permanently enclosed spaces;
- "Qualified operator"** means a person holding an appropriate certificate as defined in the Shipping (STCW Convention) Regulations;
- "Radio Regulations"** means the Radio Regulations annexed to, or regarded as being annexed to, the most recent International Telecommunication Convention which is in force at any time;
- "Recognized standards"** are the applicable international or national standards or those adopted by a classification society and accepted by the Administration;
- "Rescue boat"** is a boat designed to rescue persons in distress and to marshal survival craft;
- "Sea area A1"** means an area within the radiotelephone coverage of at least one VHF coast station in which continuous DSC alerting is available as may be defined by a Contracting Government to SOLAS 1974.
- "Sea area A2"** mean an area within the radiotelephone coverage of at least one MF coast station in which continuous DSC alerting is available as may be defined by a Contracting Government to SOLAS 1974;
- "Sea area A3"** means an area outside areas A1 and A2, within the coverage of an INMARSAT geostationary satellite in which continuous alerting is available;
- "Sea area A4"** means an area outside areas A1, A2 and A3;
- "Service spaces"** are those spaces used for galleys, pantries containing cooking appliances, lockers, mail and specie rooms, store-rooms, workshops other than those forming part of the machinery spaces, and similar spaces and trunks to such spaces;

**"SOLAS 1974"** means the International Convention for the Safety of Life at Sea 1974, as amended;

**"Similar stage of construction"** means the stage at which construction identifiable with a specific vessel begins or assembly of the vessel has commenced comprising at least 50 tonnes or one per cent of the estimated mass of all structural material, whichever is the less;

**"Steel or other equivalent material"**, Where the words "steel or other equivalent material" occur, "equivalent material" means any non-combustible material which, by itself or due to insulation provided, has structural and integrity properties equivalent to steel at the end of the applicable exposure to the standard fire test (e.g. aluminium alloy with appropriate insulation);

**"Surveyor"** means a person nominated by or authorized by the Administration or a person authorized by a classification society to conduct surveys for the purposes of Part II of the Regulations;

**"Survival craft"** means a craft provided for accommodating the persons on board in the event of abandonment of the vessel and includes lifeboats, liferafts and any other craft approved as suitable for the protection and preservation of persons in such circumstances;

**"Tanker"** is a cargo vessel constructed or adapted for the carriage in bulk of liquid cargoes of an inflammable nature;

**"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 vessel;

**"Wooden vessel of traditional build"** means a wooden vessel of traditional build not primarily propelled by mechanical means .

*Exemptions* 4. (1) The Administration may, where it considers that the sheltered nature and conditions of the voyage are such as to render the application of any specific provisions of the Regulations unreasonable or unnecessary, exempt from those requirements individual vessels or classes of vessels when engaged in such voyages.

(2) A vessel which is not normally engaged on voyages where the Regulations are applicable, but which in exceptional circumstances is required to undertake a single voyage, may be exempted by the Administration from any of the requirements of the Regulations provided that it complies with such other requirements which are, in the opinion of the Administration, adequate for the intended voyage.

(3) The Administration may exempt any vessel which embodies features of a novel kind from any of the provisions of the Regulations, the application of which might seriously impede research into development of such features and their incorporation in vessels. Any such vessel shall, however, comply with such safety requirements, which, in the opinion of the Administration, are adequate for the service for which it is intended and are such as to ensure the overall safety of the vessel.

*Equivalents*

5. Where the Regulations require that a particular fitting, material, appliance or type thereof, shall be fitted or carried in a vessel, or that particular provision shall be made, the Administration may allow any fitting, material, appliances, or type thereof to be fitted or carried, or any other provision to be made in that vessel, if it is satisfied by trials thereof or otherwise that such fitting, material, appliance, apparatus or type thereof is at least as effective as that required by the Regulations.

*Force Majeure*

6. (1) A vessel, which is not subject to the provisions of the Regulations at the time of its departure on any voyage, shall not be subject to such provisions on account of any deviation from its intended voyage due to stress of weather or any other cause.

(2) In applying the provision of the Regulations, the Administration shall give due consideration to any deviation or delay caused to any vessel by stress of weather, or any other cause.

*Standards*

7. (1) The construction, installation, structural strength, fittings, material, appliances and apparatus unless expressly provided by the Regulations, shall be of recognized standards.

(2) In addition to the requirements and standards referred to in the Regulations, other requirements and standards recommended by the Organization may be applied whenever the Administration considers such requirements and standards to be appropriate.

*Repairs*

8. (1) Repairs, alterations and modifications of a major character and outfitting related thereto on existing vessels shall meet the requirements prescribed for a new vessel to such extent, as the Administration deems reasonable and practicable. The owner shall inform the Administration of the proposed alterations and modifications before such alterations and modifications are carried out.

(2) For the purpose of the Regulations, the following repairs, alterations and modifications shall be recognized as being of "major character".

- (a) any changes that substantially alter the dimensions of the vessel;
- (b) any changes that substantially increase a vessel's service life; or
- (c) any conversions that alter the functional aspects of the vessel.

*Passengers*

9. (1) Vessels not propelled by mechanical means shall not carry any passengers when engaged in voyages.

(2) A cargo vessel shall not carry more than 12 passengers.

(3) The maximum number of passengers carried on board a passenger vessel or a cargo-passenger vessel shall not exceed the number identified on the Solomon Islands Vessel Safety Certificate.

(4) The maximum number of passengers permitted to be carried on board a passenger vessel or a cargo-passenger vessel shall be determined by the Administration on the basis of consideration of:

- (a) capacity of life-saving appliances and arrangements;
- (b) stability of the vessel; and
- (c) any other criteria considered relevant by the Administration.

*Cargoes*

10. Vessel and barges carrying cargoes specified below shall, to the extent required by the Administration in respect of the characteristics of the vessel and the voyage or voyages in which it is or is to be engaged, comply with the applicable requirements of Chapters VI and VII of SOLAS:

- 1.9.1 grain cargo in bulk;
- 1.9.2 other cargoes in bulk;
- 1.9.3 dangerous cargoes in packaged form or in bulk;
- 1.9.4 liquid chemicals in bulk;
- 1.9.5 liquefied gases in bulk; and
- 1.9.6 timber deck cargoes.

*Petrol fuelled*

11.(1) Vessels fitted with a single petrol-fuelled outboard engine shall not proceed beyond an Inshore area of operation unless authorized by the Administration.

(2) Vessels fitted with two petrol-fuelled outboard engines may proceed beyond an Inshore area of operation if the second or auxiliary engine has sufficient power of its own to enable the vessel to proceed safely to a safe haven or place of refuge.

*Management*

12. (1) The Company shall be responsible for the management of safety and environment protection in relation to the maintenance and operation of a vessel.

(2) The Administration may require the Company and the Master of a vessel to comply with the requirements of the International Safety Management Code (ISM Code) as approved by the Organization by Res. A.741(18) or with such other system of management of safety and environment protection as the Administration considers appropriate.

*Language*

13.(1) All nameplates, signs, instructions, notices, plans and documents on board vessels, relating to safety and operation of the vessel and its machinery, shall be drawn up in the official language of the Flag State and in the English language.

(2) All vessels propelled by mechanical means shall carry adequate information including drawings, plans and instruction manuals necessary for their safe operation and safety of life at sea.

*Casualties*

14. In the event of an accident involving the vessel resulting in loss of life or the vessel being materially damaged, stranded, abandoned or lost the master or the owner shall inform the Administration immediately.

*Design etc*

15. Vessels designed, constructed and maintained in compliance with the structural, mechanical and electrical requirements of a classification society which complies with the standards adopted by the Organization and which is recognized by the Administration shall be accepted as complying with the requirements of Parts III, V and VI of the Regulations.

## PART II SURVEYS AND CERTIFICATES

*General*

16.(1) The inspection, survey and marking of non-convention vessels, so far as regards the enforcement of the Regulations and the granting of exemptions there from, shall be carried out by officers of the Administration. The Administration may, however, entrust the inspections, marking and the surveys either to surveyors nominated for the purpose or to classification societies.

(2) An Administration nominating surveyors or classification societies to conduct inspections and surveys in accordance with (1) above shall as a minimum empower any nominated surveyor or classification society to carry out inspections and surveys if requested by the appropriate authorities of a Port State and require repair to a vessel.



(3) When a nominated surveyor or classification society determines that the conditions of the vessel, its equipment or the qualifications of its crew does not correspond substantially with the particulars of the Solomon Islands Vessel Safety Certificate, hereinafter called the Certificate, or is such that the vessel is not fit to proceed to sea without danger to the vessel or persons on board, such surveyor or classification society shall immediately ensure that corrective action is taken and shall notify the Administration at the earliest practical opportunity. If such corrective action is not taken the relevant certificate shall be withdrawn immediately and, if the vessel is in the port of another country, the appropriate authorities of the Port State notified immediately. When an officer of the Administration, a nominated surveyor or a classification society has notified the appropriate authorities of the Port State, the Government of the Port State concerned shall give such officer, surveyor or classification society all necessary assistance to carry out their obligations under the Regulations. When applicable, the Government of the Port State concerned shall ensure that the vessel does not sail until it can proceed to sea, or leave port only for the purposes of proceeding to the appropriate repair yard, without danger to the vessel or persons on board.

(4) In any case, the Administration shall ensure the completeness and efficiency of the inspections and surveys, and shall ensure that necessary arrangements to satisfy this obligation are established.

#### Surveys

17. All vessels to which the Regulations apply shall be subject to surveys. The general nature and the periodicity of such surveys shall be as specified in the Regulations below. The following table illustrates the timing of the surveys required by this Part.

Years	0	1	2	3	4	5
Months	0	9 - 15	21 - 27	33 - 39	45 - 51	57 - 60
Survey type	See yr 5	A	A or I	I or A	A	R
		↔	↔	↔	↔	↔

Types of survey:

- R - Renewal
- I - Intermediate
- A - Annual

#### Initial Survey

18. The initial survey before the vessel is put into service shall be such as to ensure that arrangements, equipment and systems specified below comply fully with the requirements of the Regulations and the workmanship of all such parts and equipment is in all respects satisfactory and shall include an inspection of the outside of the vessel's bottom.

- (a) arrangements, materials and scantlings of the structure;
- (b) boilers and other pressure vessels;
- (c) main and auxiliary machinery including steering gear and associated control systems;
- (d) fire safety systems and appliances, life-savings appliances and arrangements, navigational equipment, nautical publications, means of embarkation for pilots;
- (e) radio installation, including those used in life-saving appliances;
- (f) arrangements for the control of discharge of oil and for the retention of oil on board;
- (g) provision of the lights, shapes, means of making sound signals as required by the provisions of COLREG;
- (h) arrangements, materials and scantlings relating to the requirements of Part XII as regards the conditions for assignment of load line and freeboard;
- (i) arrangements for the safety of the crew and passengers relating to the requirements of Part XIII.

*Renewal Survey*

19. A renewal survey shall be carried out at intervals not exceeding 5 years, except where regulation 29(2) is applicable. The renewal survey shall include an inspection of the equipment referred to in regulation 18 to ensure that it complies with the relevant requirements of the Regulations and COLREG.

*Intermediate Survey*

20. An intermediate survey shall be carried out within three months before or after the second anniversary date or within three months before or after the third anniversary date of the Certificate. The intermediate survey shall take the place of one of the annual surveys specified in regulation 21 and shall include an inspection with tests where necessary of the equipment to ensure that the requirements relating to the life-saving appliances, fire appliances and the light and sound signals are complied with and that they are in satisfactory condition and are fit for the intended service of the vessel. All certificates, record books, operating manuals and other instructions and documents specified shall be checked for their adequacy. The intermediate survey shall also include an inspection of items relating to Parts III to VII inclusive and Parts IX to XIII inclusive of the Regulations to ensure that they are in a satisfactory condition and fit for the intended service of the vessel. When carrying out a detailed inspection of items of hull and machinery, due account shall be taken of any continuous survey schemes adopted.

- Annual Survey* 21. An annual survey shall be carried out within three months before or after each anniversary date of the Certificate. The annual survey shall include an inspection to ensure that:
- (a) the equipment referred to in regulation 16(1) remains satisfactory for the service for which the vessel is intended ;
  - (b) alterations have not been made to the hull or superstructures which would affect the calculations determining the position of the load lines;
  - (c) the fittings and appliances for the protection of openings, guard rails, freeing ports and means of access to crew's quarters are maintained in an effective condition.
- Additional Survey* 22. An additional survey shall be conducted after repair resulting from investigations whenever an accident occurs to a vessel or a defect is discovered, either of which affects the safety of the vessel, or whenever any important repair or renewals are made. The survey shall be conducted so as to ensure that all necessary repairs and renewals are effectively made.
- Hull Inspection* 23. A minimum of two inspections shall be carried out of the vessel's hull, including an inspection of the outside of the vessel's bottom, during any five-year period. As far as practicable the interval between any two such inspections shall not exceed 36 months. The inspection of the outside of the vessel's bottom and the survey of related items inspected at the same time shall be such as to ensure that they remain satisfactory for the service for which the vessel is intended. The inspection of the outside of the vessel's bottom may be conducted with the vessel in the water. It is preferable that one of the inspections should coincide with the renewal survey
- Endorsement* 24. The intermediate and the annual surveys referred to in regulations 20 and 21 respectively shall be endorsed on the Certificate.
- Compliance* 25. Where a vessel complies with the relevant provisions of the international Conventions specified in regulation 2 in lieu of compliance with any of the Regulations, the Administration shall ensure that prior to issue of any certificate under the Regulations any such provisions of such other Conventions are complied with in full.
- Maintenance* 26. (1) The conditions of the vessel and its equipment shall be maintained by the master and Company to comply with the provisions of the Regulations and to ensure that the vessel in all respects will remain fit to proceed to sea without danger to the vessel or persons on board and without damage to the marine environment.
- (2) After any survey of the vessel under this Part is completed, no change shall be made in the structural arrangements, machinery, equipment and other items covered by the survey, without the prior approval of the Administration.

(3) Whenever an accident occurs to the vessel or a defect is discovered, either of which affects the safety of the vessel or the efficiency or completeness of its life-saving appliance or other equipment, a request shall be made immediately to the Administration for a survey as may be required by regulation 17 to be carried out as soon as practicable.

*Issue*

27 (1) Subject to the provisions of regulation 25, a Solomon Islands Vessel Safety Certificate shall be issued, after an initial survey specified in regulation 18 or a renewal survey specified in regulation 19, to a vessel which complies with the relevant requirements of the Regulations. In any case the Administration shall ensure the completeness of the inspections by appropriate means prior to the issue of any certificates. The Certificate shall be drawn up in the English language in a form corresponding to the format as specified in Schedule I to the Regulations.

(2) The Certificate issued under (1) above shall be supplemented by the Record of Equipment and Ship Information. The Record of Equipment and Ship Information shall be drawn up in the English language in a form corresponding to the format as specified in Schedule II to the Regulations. The Record of Equipment and Ship Information shall be completed and kept on board the vessel.

(3) When an exemption is granted by the administration to a vessel under and in accordance with the provisions of the Regulations a Solomon Islands Vessel Exemption Certificate shall be issued in addition to the Certificate issued under (1) above. The Solomon Islands Vessel Exemption Certificate shall be drawn up in the English language in a form corresponding to the format as specified in Schedule III to the Regulations. The Solomon Islands Vessel Exemption Certificate shall be attached to the Certificate to which it refers.

(4) The certificates referred to in (1) and (3) shall be issued or endorsed either by the Administration or by any person or organization authorised by it. In all cases, the Administration shall assume full responsibility for the condition of the vessel and its equipment as attested to by the Certificate.

*Foreign Governments*

28. A Government applying the provisions of the Regulations may, at the request of the Administration, cause a vessel to be surveyed and, if satisfied that the requirements of the Regulations are complied with, issue or authorize the issue of the Certificates to the vessel and, where appropriate, endorse or authorize the endorsement of the Certificate in accordance with the requirements of the Regulations. Any certificate so issued shall contain a statement to the effect that it has been issued at the request of the Government of the Flag State.

*Duration etc.*

29.(1) A Solomon Islands Vessel Safety Certificate shall be issued for a period as specified by the Administration. Such period shall not exceed five years. A Solomon Islands Vessel Exemption Certificate to which it relates.

(2) Notwithstanding the requirement of (1) above, when the renewal survey is completed within three months before the expiry date of the existing Certificate, the new Certificate shall be valid from the date of completion of the renewal survey to a date not exceeding 5 years from the date of expiry of the existing Certificate.

(3) When the renewal survey is completed after the expiry date of the existing Certificate, the new Certificate shall be valid from the date of completion of the renewal survey to a date not exceeding five years from the date of expiry of the existing Certificate..

(4) When the renewal survey is completed more than three months before the expiry date of the existing Certificate, the new Certificate shall be valid from the date of completion of the renewal survey to a date not exceeding five years from the date of completion of the renewal survey.

\* (5) If a renewal survey has been completed and the new Certificate cannot be issued or placed on board the vessel before the expiry date of the existing Certificate, the person or the organization authorised by the Administration may endorse the existing Certificate and such Certificate shall be accepted as valid for a further period which shall not exceed one month from the expiry date.

(6) If a vessel, at the time when the Certificate expires is not in a port in which it is to be surveyed, the Administration may extend the period of validity of the Certificate but this extension shall be granted only for the purpose of allowing the vessel to complete its voyage to the port in which it is to be surveyed, and only in cases where it appears proper and reasonable to do so. No Certificate shall be extended for a period longer than one month, and a vessel to which such an extension is granted shall not, on its arrival in the port in which it is to be surveyed, be entitled by virtue of such extension to leave that port without a new certificate. Where the renewal survey is completed the new certificate shall be valid to a date not exceeding 5 years from the date of expiry of the existing Certificate before the extension was granted.

(7) If an annual or intermediate survey is completed before the periods specified in the relevant Regulation then:

- (a) the anniversary date shown on the relevant certificate shall be amended by endorsement to a date, which shall not be more than three months later than the date on which the survey was completed;
- (b) the subsequent annual or intermediate survey required by the relevant Regulations shall be completed at the intervals prescribed by the Regulations using the new anniversary date;

(c) the expiry date may remain unchanged provided one or more annual or intermediate surveys, as appropriate, are carried out so that the maximum intervals between the surveys, as appropriate, are carried out so that the maximum intervals between the surveys prescribed by the relevant Regulations are not exceeded.

(8) A Certificate issued under this Part shall cease to be valid in any of the following cases:

- (a) if the relevant surveys and inspections are not completed within the periods specified in this Part;
- (b) if the Certificate is not endorsed in accordance with this Part;
- (c) upon transfer of the vessel to the flag of another State.

(9) In the case of transfer of ownership of a vessel between Pacific Island Countries, if requested within three months after such transfer, the Government of the country whose flag the vessel was formerly entitled to fly shall, as soon as possible, transmit to the Administration copies of the certificates carried by the vessel before the transfer and, if available, copies of the relevant survey reports.

*Availability*

30. The certificates issued under this Part shall be readily available on board for examination at all times.

*Control*

31. (1) Every vessel when in a port of a country applying the Regulations is subject to control by officers duly authorized by such Government in so far as this control is directed towards verifying that the certificate issued under the Regulations is valid.

(2) Such certificate, if valid, shall be accepted unless there are clear grounds for believing that the vessel and/or its equipment does not correspond substantially with the particulars of the certificate.

(3) In the circumstances given in (2) or where the certificate has expired or ceased to be valid, the officer carrying out control shall take steps to ensure that the vessel does not sail until it can proceed to sea or leave the port for the purpose of proceeding to the appropriate repair yard without danger to vessel or persons on board.

(4) In the event of any intervention being necessary the Port State shall inform the appropriate consular officer or Administration of the Flag State, the nominated surveyors and the classification society.

(5) When exercising control all possible efforts shall be made to avoid a vessel being unduly delayed or detained. If a vessel is unduly delayed or detained it shall be entitled to compensation for any loss or damage suffered.

### PART III CONSTRUCTION AND EQUIPMENT

*General*

32. (1) All machinery and electrical installations, mechanical and electrical equipment and appliances, boilers and other pressure vessels, associated piping systems and fittings and electrical cables and wiring shall be of a design and construction adequate for the service for which they are intended and shall be so installed and protected as to reduce to a minimum any danger to persons on board, due regard being paid to moving parts, hot surfaces and other hazards. The design shall have regard to materials used in construction, and to the purposes for which the vessel and its equipment are intended, the working conditions and the environmental conditions on board.

(2) In addition to the requirements contained elsewhere in the Regulations, vessels shall be designed, constructed and maintained in compliance with the structural, mechanical and electrical requirements of a classification society that is recognized by the Administration, with the applicable national standards of the Administration or with other appropriate standards recognized by the Administration that provide an equivalent level of safety.

*Construction*

33. (1) The strength and construction of hull, superstructures, deckhouses, machinery casings, companion ways and any other structure and equipment shall be sufficient to withstand all foreseeable conditions of the intended service. The strength of the deckhouses used for the accommodation of the crew shall be adequate for the intended service and area of operation of the vessel.

(2) Vessels of 15m and above in length propelled by mechanical means shall be fitted with a collision bulkhead in accordance with regulation 34, an aft peak bulkhead in accordance with regulation 35 and with watertight bulkheads bounding the machinery spaces. Such bulkheads shall be extended up to the freeboard deck. In vessels constructed of wood such bulkheads shall be watertight as far as practicable.

(3) Propeller shaft logs or stern tubes situated in any space other than machinery spaces containing main propulsion machinery shall be enclosed in watertight spaces or enclosures inside such space acceptable to the Administration. The Administration may exempt from these requirements vessels having constraint of space or vessels certificated to undertake voyages in inshore areas of operation, provided it is demonstrated that any progressive flooding of such space can be easily controlled and that the safety of the vessel is not thus impaired.

(4) Stern glands shall be located in spaces, which are easily accessible at all times for inspection and maintenance to the satisfaction of the Administration.

*Collision  
Bulkheads*

34. (1) For the purpose of this regulation, freeboard deck, length of vessel and forward and after perpendiculars have the meanings as defined in regulation 2.

(2) A collision bulkhead shall be fitted which shall be watertight up to the freeboard deck. This bulkhead shall, as far as practicable, be located at a distance from the forward perpendicular of not less than 5 per cent and not more than 8 per cent of the length of the vessel. Where it can be shown to the satisfaction of the Administration that it is impractical for the collision bulkhead to be located at a distance from the forward perpendicular of not more than 8 per cent of the length of the vessel, the Administration may allow relaxation there from, subject to the condition that should the space forward of the bulkhead be flooded, the vessel at full load condition will not be submerged to a line drawn at least 76mm below the upper surface of the bulkhead deck at side.

(3) The collision bulkhead may have steps or recesses in it provided that they are within the limits prescribed in (2), above. Pipes piercing the collision bulkhead shall be kept to the minimum and shall be fitted with suitable valves operable from above the freeboard deck with the valve chest secured at the collision bulkhead inside the forepeak. Any such valves located on the after side of the collision bulkhead shall be readily accessible under all service conditions and shall not be located in a cargo space. All such valves shall be of steel, bronze or other appropriate ductile material. Valves of ordinary cast iron or similar material are not acceptable.

(4) Where a long forward superstructure is fitted, the collision bulkhead shall be extended weathertight to the deck immediately above the freeboard deck. The extension shall, subject to the requirements of (3), be located within the limits prescribed in (2). The part of the deck, if any, between the collision bulkhead and its extension shall be weathertight.

(5) Where a bow door is fitted and a sloping ramp that forms part of the extension of the collision bulkhead above the freeboard deck is fitted that encloses watertight forecastle superstructure, the part of the extension which is more than 2.3m, or a distance specified by the Administration, above the freeboard deck may extend no more than 1m forward of the forward limits specified in (2). The ramp shall be weathertight over its complete length.

(6) Landing barges need not be fitted with a collision bulkhead provided that it can be demonstrated that the arrangements provide a level of safety that is no less than if a collision bulkhead is fitted in the event of a collision at the bow causing damage extending to 8 per cent of the length of the vessel aft of the forward perpendicular.

(7) The number of openings in the extension of the collision bulkhead above the freeboard deck be reduced to the minimum compatible with the design and normal operation of the vessel. All such openings shall be capable of being closed weathertight.

(8) No doors, manholes, ventilation ducts or access openings are permitted in the collision bulkhead below the freeboard deck.

(9) Where a chain locker is located abaft the collision bulkhead, or extends into the forepeak tank, it shall be watertight and provided with efficient means of drainage.



*Watertight  
Bulkheads, decks etc.*

35. (1) This regulation shall apply to new vessels propelled by mechanical means.

(2) Each watertight subdivision bulkhead, whether transverse or longitudinal, shall be demonstrated to be constructed in such a manner that it shall be capable of withstanding, with a proper margin of resistance, stresses occurring in the loaded ship in a sea way together with the pressure due to the maximum head of water which it might have to sustain in the event of damage to the vessel but at least the pressure due to a head of water up to the margin line. Bulkheads constructed in accordance with the requirements of a classification society are accepted as meeting these requirements. The number of bulkheads fitted shall comply with Schedule IV.

(3) Steps and recesses in bulkheads shall be watertight and of the same strength as the bulkhead at the place where each occurs

(4) Where frames or beams pass through a watertight deck or bulkhead, such deck or bulkhead shall be made structurally watertight.

(5) The number of openings in watertight bulkheads shall be reduced to the minimum compatible with the general arrangements and operational needs of the vessel. Openings shall be fitted with watertight closing appliances. Watertight doors shall be of equivalent strength to the adjacent unpierced structure.

(6) Watertight decks, trunks, tunnels, duct keels and ventilators shall be of the same strength as watertight bulkheads at corresponding levels. Arrangements adopted for closing openings in them shall be appropriate to the structure concerned. Watertight ventilators and trunks shall be carried at least up to the freeboard deck.

(7) Testing main compartments by filling them with water is not compulsory. When testing by filling with water is not carried out, a hose test shall be carried out in the most advanced stage of the fitting out of the vessel. In any case, a thorough inspection of watertight bulkheads shall be carried out.

(8) The forepeak, double bottom tanks (including duct keels) and inner skins shall be tested with water to a head corresponding to the requirements of (2), above.

(9) Tanks which are designed to hold liquids, and which form part of the subdivision of the vessel, shall be tested for tightness with water to a head corresponding to two-third of the depth from the top of keel to the margin line in way of the tanks, provided that in no case shall the test head be less than 0.9m above the top of the tank.

(10) The tests referred to in (8) and (9) are for the purpose of ensuring that the subdivision structural arrangements are watertight and are not to be regarded as a test of the fitness of any compartment for the storage of oil fuel or for other special purposes for which a test of a superior character may be required depending on the height to which the liquid has access in the tank or its connections.

*Sounding*

36. (1) Means for sounding shall be provided for the bilges of those compartments which are not readily accessible at all times during the voyage and for all tanks and cofferdams.

(2) Where sounding pipes are fitted, their upper ends shall be extended to a readily accessible position and, where practicable, above the freeboard deck. Their openings shall be provided with permanently attached means of closing. Sounding pipes, which are not extended above the freeboard deck, shall be fitted with automatic self-closing devices. The lower end of sounding pipes shall be provided with striker plates.

*Anchoring &  
Mooring Equipment*

37. (1) At least two anchors of sufficient mass shall be provided. The mass of each shall comply with Schedule V.

(2) At least one anchor shall be provided with a chain of strength and size consistent with the mass of the anchor. The size of the chain cable, rope or wire rope shall comply with Schedule V.

(3) The windlass, capstan or winch shall be of suitable size for the cable and other anchor handling equipment and arrangements shall be to the satisfaction of the Administration.

(4) The administration may permit carriage of only one anchor with adequate chain or wire and other arrangements taking into account the size of the vessel and its area of operation.

(5) Windlass, capstan, winches, fairleads, bollards, mooring bitts and other anchoring, mooring, towing and hauling equipment shall be properly designed to meet all foreseeable operational loads and conditions, correctly seated and effectively secured to a suitably strengthened part of the vessels structure.

(6) Arrangements and equipment for raising and lowering anchors shall be fitted in accordance with the following:

- (a) The arrangement shall be of sufficient power to lift each anchor and its full length of cable or chain;
- (b) Each cable lifter shall be fitted with a release coupling and a brake of sufficient capacity for the safe stopping of anchors and cables when paying out;
- (c) The equipment, with brakes engaged and release couplings disengaged, shall be demonstrated to withstand a static pull of 45 per cent of the required cable minimum breaking load on all cable lifters simultaneously without any brake slip;
- (d) If a chain stopper is not fitted, the equipment shall be able to withstand a static pull equal to the minimum breaking strength of the cable without release of the cable;
- (e) An adequate cover or seal shall be provided for each spurling pipe to prevent flooding of the chain locker when the vessel is at sea.

*Towing &  
Pushing Arrangements*

38. (1) The design of the towing gear shall be such as to minimize the overturning moment due to the lead of the towline. It shall have a positive means of quick release, designed and maintained so as to function correctly under all operating conditions.

(2) All quick release mechanisms shall be controlled, as far as practicable, from the navigating bridge and from the after control position, if fitted, and at the hook itself.

(3) When a pushing tug and a barge pushed ahead are rigidly connected in a composite unit, the tug-barge coupling system shall be capable of being controlled and powered from the tug. Disassembly shall be capable of being made without causing damage to the tug or the barge.

(4) Every tug shall be provided with at least one axe of sufficient size on each side of the vessel so as to be readily available for cutting the towline free in an event of an emergency.

(5) Sufficient spare equipment to completely remake the towing and mooring arrangements for the tow shall be available on the tug.

(6) Secondary or emergency towing arrangements shall be fitted on board the barge so as to be easily recoverable by the towing tug in the event of failure of the main towing wire or failure of ancillary equipment.

*Brig Barges*

39. (1) The towing and mooring arrangements shall be such as to reduce to a minimum any danger to personnel during towing or mooring operation. Such arrangements shall be suitable for the particular type of barge and of adequate strength.

(2) The design and arrangements of fittings or equipment for towing and mooring of barges shall take into account both normal and emergency conditions.

(3) In addition to the provisions of the Regulations, the Administration may require that tugs and barges shall comply with the applicable requirements for the safety of towed vessels and other floating objects recommended by the Organization.

#### PART IV

#### STABILITY REQUIREMENTS AND BILGE PUMPING ARRANGEMENTS

*Intact Stability*

40. (1) Provisions (2), (3) and (6) shall apply to all vessels propelled by mechanical means except fishing vessels. (4) shall apply to barges only. (5) shall apply to fishing vessels.

(2) Subject to the provisions of (3), vessels of 24m and above in length shall comply with the stability criteria set out in Schedule VI. The intact stability requirements for vessels unable to comply with the Schedule VI requirements shall be determined according to the criteria specified in the Stability Code, or comply with the equivalent stability standards adopted by the Administration. Cargo-passenger vessels shall comply with the intact stability requirements applicable to passenger vessels.

(3) Vessels of 24m and above in length whose characteristics, in the opinion of the Administration, are similar to those of an offshore supply vessel and thus render compliance with (2) impracticable shall comply with the stability criteria set out in paragraph 4.5.6 of the Stability Code.

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(4) The intact stability of barges (including pontoons) 24m and above in length carrying only deck cargoes, having no hatchways in the deck except small manholes closed with gasketed covers, no machinery installations and no accommodation and service spaces shall be in accordance with the stability requirements specified in 6 of Schedule VI. The intact stability requirements for barges 24m and above in length carrying underdeck cargoes or having machinery installations or service spaces shall be determined by the Administration, having regard to the design and arrangements of cargo spaces, machinery, equipment, deck houses or superstructures.

(3) When a pushing tug and a barge pushed ahead are rigidly connected in a composite unit, the tug-barge coupling system shall be capable of being controlled and powered from the tug. Disassembly shall be capable of being made without causing damage to the tug or the barge.

(5) Fishing vessels 24m and above in length shall comply with the stability criteria set out in Schedule VI.

(6) For vessels 15m and above in length and less than 24m in length the Administration may apply either the provisions of 4 of Schedule VI or the provisions of the Stability Code, whichever is the more reasonable and appropriate. The intact stability of vessels that are not covered by the provisions of 4 of Schedule VI or by the Stability Code shall be to a standard satisfactory to the Administration. The Administration may specify that such ships be subject to restrictions shall be recorded on the Solomon Islands Vessel Safety Certificate.

(7) In addition to complying with the applicable provisions of (2) to (6) inclusive, the Administration may require, having regard to the nature of intended services, application of weather criteria specified in paragraph 3.2 of the Stability Code.

*Tests and loading*

41. (1) Every vessel shall undergo an inclining test upon its completion and the actual displacement and position of the centre of gravity shall be determined for the light ship condition. Where hydrostatic data is not available the Administration may accept the result of a roll test conducted in accordance with 7 of Schedule VI, to enable the stability characteristics of the vessel to be determined. Every existing passenger vessel and cargo-passenger vessel shall undergo an inclining test or roll five years after the entry into force of these Regulations.

(2) Where major alterations are made to a vessel affecting its light condition and the position of the centre of gravity, the vessel shall undergo a roll test or a lightweight survey. Where the Administration so requires, a ship that has been grounded shall undergo an inclining test or a roll test.

(3) Passenger and cargo-passenger vessels shall undergo a lightweight survey at intervals of no more than 10 years. Where hydrostatic data is not available the Administration may accept the result of a roll test conducted in accordance with 6 of Schedule VI, to enable any change in the stability characteristics of the vessel to be identified.

*Copied from 38(3)*

(4) If the lightship weight and longitude centre of gravity (LCG) measured by means of a light-weight survey in accordance with (2) and (3) vary from that in the original stability information by more than 2 per cent of lightship displacement or 1 per cent of length respectively, the vessel shall be re-inclined and the stability information amended and submitted to the administration for approval. If a roll test, carried out in accordance with (2) and (3), demonstrates that the period of roll has increased by more than 2 per cent of that originally measured, the Administration shall determine appropriate action.

(5) The inclining test of an individual vessel may be dispensed with provided that it is demonstrated to the Administration that reliable stability information for the vessel can be obtained from basic data available from the inclining test of a sister ship and that during the construction the same weights of components and weight distribution was observed.

(6) The Administration may allow the inclining test of a cargo vessel or a class of vessels especially designed for the carriage of liquids or ore in bulk to be dispensed with, if it is demonstrated with reference to existing data for similar vessels that, due to vessel proportions and arrangements, more than sufficient transverse metacentric height will be available in all probable loading conditions.

(7) Stability information approved by the Administration shall be supplied to vessels propelled by mechanical means to enable the master to assess with ease and certainty the stability of the vessel under various operating conditions. Such information shall include specific instructions to the master warning of those operating conditions, which could adversely affect either stability or the trim of the vessel.

(8) In particular, the information identified in Schedule VII shall be included as appropriate. As an alternative to a comprehensive stability book as defined in 1.2 of Schedule VII, a simplified booklet in accordance with 2 of Schedule VII, containing sufficient information, to enable the master to operate the ship in compliance with the applicable provisions of the regulations, may be provided at the discretion of the Administration. A copy of the stability information shall be submitted to the Administration for approval.

(9) The approved stability information shall be kept on board, readily accessible at all times and available to be inspected at the intermediate surveys of the vessel to ensure that it has been approved and the condition of the vessel since its approval has not changed.

(10) Where alterations are made to a vessel affecting its stability, revised stability calculations shall be prepared and submitted to the Administration for approval. Such revised information shall be supplied to the master and the superseded information removed from the vessel.

(11) Sufficient information, approved by the Administration, shall be supplied to vessels propelled by mechanical means to enable the master to arrange for the loading and ballasting of the vessel in such a way as to avoid the creation of unacceptable stresses in the vessel's structure. The Administration may waive this requirement where it is demonstrated that no practical loading condition will result in the creation of unacceptable stresses in the structure

*Passenger Vessels*

42. (1) New passenger vessels 24m in length and above shall comply with the requirements of 5 of Schedule VI to the extent considered reasonable and practicable by the Administration.

(2) New passenger vessels less than 24m in length shall comply with the requirements of 5 of Schedule VI to the extent considered reasonable and practicable by the Administration.

*Bilge Pumping*

43 (1) An efficient bilge pumping arrangement shall be provided which under all practical conditions shall be capable of pumping from and draining any watertight compartment other than a space permanently appropriate for the carriage of fresh water, water ballast, oil fuel or liquid cargoes for which other efficient means for pumping are provided. Where the Administration is satisfied that the safety of the vessel is not impaired, the bilge pumping arrangements may be dispensed with in any particular compartment and in unmanned barges without machinery spaces.

(2) The arrangement of the bilge and ballast pumping system shall be such as to prevent the possibility of water passing from sea and from water ballast spaces into the cargo and machinery spaces, or from one compartment to another.

(3) All distribution boxes and manually operated valves in connection with the bilge pumping arrangements shall be located so as to be accessible under ordinary circumstances.

(4) Bilge pumping arrangements shall be in accordance with Schedule VIII. Where two power bilge pumps required, one of them may be driven by the propulsion machinery. Where a vessel is fitted with two independently operated main propulsion machinery units; each unit may drive one of the required bilge pumps. In every such case the propeller shaft shall be able to be readily disconnected or a controllable pitch propeller fitted.

(5) Notwithstanding the requirements of 2 of Schedule VIII, the total capacity of the required bilge pumps shall not be less than 125 per cent of the total capacity of the required main fire pump referred to in regulation 62.

(6) Sanitary, ballast and general service pumps provided with suitable connections for bilge suction may be accepted as independent power bilge pumps.

(7) A bilge ejector in combination with an independently driven high-pressure sea-water pump may be installed, provided this arrangement is to the satisfaction of the Administration.

- (8) Bilge pipes shall not be led through fuel oil, fresh water, ballast or double bottom tanks, unless pipes are of heavy gauge steel construction.

## PART V MACHINERY INSTALLATIONS

### *General*

44. (1) All boilers and other pressure vessels, all parts of machinery, all steam, hydraulic, pneumatic and other systems and their associated fittings which are under internal pressure shall be subjected to appropriate tests, including a pressure test before being put into service for the first time, in accordance with a recognised national standard or with the standards of a classification society.
- (2) Means shall be provided to ensure that the machinery can be brought into operation from the dead ship condition without external aid.
- (3) Adequate provisions shall be made to facilitate cleaning, inspection and maintenance of machinery installations including boilers and other pressure vessels.
- (4) Where risk from overspeeding of machinery exists, means shall be provided to ensure that the safe speed is not exceeded.
- (5) Where main or auxiliary machinery including pressure vessels or any parts of such machinery are subject to internal pressure and may be subject to dangerous overpressure means shall be provided, where practicable, to protect against such excessive pressure.
- (6) All gearing and every shaft and coupling used for transmission of power to machinery essential for the propulsion and safety of the vessel or for the safety of persons on board shall be so designed and constructed that they will withstand the maximum working stresses in all service conditions. Due consideration shall be given to the type of engines by which they are driven or of which they form part.
- (7) Main propulsion machinery and auxiliary machinery shall be provided with automatic shutoff arrangements in the case of failures, such as lubrication oil supply failure, which could lead rapidly to complete breakdown, serious damage or explosion. Any overriding automatic shutoff devices shall be approved by the Administration.
- (8) Internal combustion engines of a cylinder diameter of 200mm or a crankcase volume of 0.6 m<sup>3</sup> and above shall be provided with crankcase explosion relief valves of a suitable type with sufficient relief area. The relief valves shall be arranged or provided with means to ensure that discharge from them is so directed as to minimize the possibility of injury to personnel.

### *Controls*

- 45 (1) Main and auxiliary machinery essential for the propulsion and safety of the vessel shall be provided with effective means for its operation and control.

(2) Means shall be provided whereby normal operations of propulsion machinery can be sustained or restored, even though one of the essential auxiliaries becomes inoperative. Special consideration shall be given to the malfunctioning of:

- (a) an electrical power generator which serves as a main source of electrical power;
- (b) the sources of lubricating oil pressure;
- (c) the fuel oil supply systems for engines;
- (d) the sources of water pressure;
- (e) an air compressor and receiver for starting or for control in main propulsion machinery including control purposes;
- (f) the hydraulic, pneumatic or electrical means for control in main propulsion machinery including controllable pitch propellers;
- (g) steam boilers and boiler feed systems, if provided.

(3) Special consideration shall be given to the design, construction and installation of propulsion machinery systems so that any mode of vibration shall not cause undue stresses in machinery in its normal operating ranges.

*Remote control*

46. (1) where remote control of propulsion machinery from the navigating bridge is provided and the machinery spaces are intended to be manned, the following shall apply:
- (a) the speed, direction of thrust and, if applicable, the pitch of the propeller shall be fully controllable from the navigating bridge under all sailing conditions, including manoeuvring;
  - (b) the remote control shall be performed, for each independent propeller, by a control device so designed and constructed that its operation does not require particular attention to the operational details of the machinery. Where multiple propellers are designed to operate simultaneously, they may be controlled by one control device;
  - (c) the main propulsion machinery shall be provided with an emergency stopping device on the navigating bridge which shall be independent of the navigating bridge control system;
  - (d) propulsion machinery orders from the navigating bridge shall be indicated in the main machinery control room or at the manoeuvring platform as appropriate;
  - (e) remote control of the propulsion machinery shall be possible only from one location at a time; at such locations interconnected control positions are permitted. At each location there shall be an indicator showing which location is in control of the propulsion machinery. The transfer of control between the navigation bridge and machinery spaces shall be possible only in the main machinery space or the main machinery control room. This system shall include means to prevent the propelling thrust from altering significantly when transferring control from one location to another;
  - (f) it shall be possible to control the propulsion machinery locally, even in the case of failure in any part of the remote control system;



- (g) the design of the remote control system shall be such that in case of its failure an alarm will be given. Wherever practicable, the preset speed and direction of thrust of the propellers shall be maintained until local control is in operation;
- (h) indicators shall be fitted on the navigation bridge for propeller speed and direction of rotation in the case of fixed pitch propellers and propeller speed and pitch position in the case of controllable pitch propellers;
- (i) an alarm shall be provided on the navigating bridge and in the machinery space to indicate low starting air pressure or low electrical power which shall be set at a level to permit further main engine starting operation. If the remote control systems of the propulsion machinery is designed for automatic starting, the number of automatic consecutive attempt which fail to produce a start shall be limited in order to safeguard sufficient starting air pressure or adequate electrical power for starting locally.

(2) In all vessels where the main propulsion and associated machinery including main electrical supply, are provided with various degrees of automatic or remote control and are under continuous manual supervision from a control room, the arrangements and controls shall be so designed, equipped and installed that the machinery operation will be as safe and effective as if it were under direct supervision. Particular consideration shall be given to the protection of such spaces against fire and flooding.

*Unattended Space* .47. (1) A vessel complying with the applicable requirements of Part E of Chapter II-1 of SOLAS 74 relating to periodically unattended machinery spaces will comply with the requirements of the Regulations.

(2) Where vessels are fitted with periodically unattended machinery spaces the Administration shall be provided with documentation demonstrating that the safety of the vessel in all sailing condition, including manoeuvring, is equivalent to that of a vessel having manned machinery spaces. The Administration may require the application of the relevant requirements of SOLAS 74 in particular cases.

(3) Measures shall be taken by the master and the Company to ensure that the equipment functions in a reliable manner and that the arrangements are regularly inspected and routine tests carried out to ensure continuous reliable operation.

(4) The Administration shall be provided with documentary evidence of the fitness of a vessel to operate with periodically unattended machinery spaces.

(5) In addition to compliance with the provisions of regulation 46, particular attention shall be given to arrangements for:

- (a) precautions against fire occurring in, or in association with, main and auxiliary machinery;
- (b) protection against flooding of the machinery spaces, including the installation of bilge alarms, the provision of bilge pumps having automatic starting and the location of the controls of valves serving sea inlets;
- (c) alarm systems;
- (d) safety systems in the event of malfunctions of machinery;
- (e) the integrity of the supply of electrical power to propulsion, steering and the safety of the vessel.

*Boilers* 48. (1) Every steam boiler and every unfired steam generator shall be provided with not less than two safety valves of adequate capacity. However, having regard to the output or any other features of any boiler or unfired steam generator, the Administration may permit only one safety valve to be fitted if it is satisfied that adequate protection against overpressure is thereby provided.

(2) Each oil-fired boiler which is intended to operate without manual supervision shall have safety arrangements which shut off the fuel supply and give an alarm in the case of low water level, air supply failure or flame failure.

(3) Every steam generating system which provides services essential for the safety of the vessel, or which could be rendered dangerous by the failure of its feed water supply, shall be provided with not less than two separated feedwater systems from and including the feed pumps, noting that a single penetration of the steam drum is acceptable. Unless overpressure is prevented by the pump characteristics means shall be provided which will prevent overpressure in any part of the systems.

(4) Boilers shall be provided with means to monitor and control the quality of the feedwater. Suitable arrangements shall be provided to preclude, as far as practicable, the entry of oil or other contaminants, which may adversely affect the boiler.

(5) Every boiler essential for the safety of the vessel and designed to contain water at a specified level shall be provided with at least two means for indicating its water level, at least one of which shall be a direct reading gauge glass.

(6) Water tube boilers serving turbine machinery shall be fitted with a high-water-level alarm.

*Steam Pipe* 49. (1) Every steam pipe and every fitting connect thereto through which steam may pass shall be so designed, constructed and installed as to withstand the minimum working stresses to which it may be subjected.

(2) Means shall be provided for draining every steam pipe in which dangerous water hammer action might otherwise occur.

(3) If a steam pipe or fitting may receive steam from any source at a higher pressure than that for which it is designed a suitable pressure-reducing valve, relief valve and pressure gauge shall be fitted.

*Air Pressure* 50. (1) In every vessel means shall be provided to prevent overpressure in any part of compressed air systems and wherever water jackets or casings of air compressors and coolers might be subjected to dangerous overpressure due to leakage into them from air pressure parts. Suitable pressure relief arrangements shall be provided for all systems

(2) The main starting air arrangements for main propulsion internal combustion engines shall be adequately protected against the effects of backfiring and internal explosion in the starting air pipes.

(3) All discharge pipes from starting air compressors shall lead directly to the starting air receivers, and all starting pipes from the air receivers to main or auxiliary engines shall be entirely separate from the compressor discharge pipe system.

(4) Provision shall be made to reduce to a minimum the entry of oil into the air pressure systems and to drain these systems.

*Ventilation* 51. (1) All spaces containing machinery shall be adequately ventilated so as to ensure that when machinery or boilers therein are operating at full power in all weather conditions including heavy weather, an adequate supply of air is maintained to the spaces for the safety and comfort of personnel and the operation of the machinery.

(2) In addition to complying with the requirements of (1), the ventilation of machinery spaces shall be sufficient under all normal conditions to prevent accumulation of oil vapour.

*Noise protection* 52. (1) Where machinery spaces are to be manned, measures shall be taken to reduce the noise in machinery spaces to acceptable levels. Guidance on noise level limits is given in Schedule IX.

(2) If the noise level in any space cannot be sufficiently reduced, the source of excessive noise shall be suitably insulated or isolated or a refuge from noise shall be provided. Ear protectors shall be provided for personnel required to enter any spaces if the noise level is above 85 dBA measured in accordance with the standards of the Organization.

*Means of going astern* 53. (1) Sufficient power for going astern shall be provided to secure proper control of the vessel in all normal circumstances.

(2) The ability of the machinery to reverse the direction of thrust of the propeller in sufficient time and so to bring the vessel to rest within a reasonable distance from maximum ahead service speed, shall be demonstrated and recorded.

(3) The stopping times, vessel headings and distances recorded on trials, together with the results of trials to determine the ability of vessels having multiple propellers to navigate and manoeuvre with one or more propellers inoperative, shall be available on board.

(4) Where the vessel is provided with supplementary means for manoeuvring or stopping, the effectiveness of such means shall be demonstrated and recorded as referred to in (2) and (3) and appropriate information made available on board the vessel.

*steering Gear* 54. (1) Every vessel shall be provided with a main steering gear and, subject to the provisions of (4), with an auxiliary means of steering the vessel in the event of failure of the main steering gear.

(2) The main steering gear shall be of adequate strength and capable of steering the vessel at maximum ahead service speed. The main steering gear and rudder stock shall be so designed that they will not be damaged at maximum astern speed.

(3) The auxiliary means of steering shall be of adequate strength and capable of steering the vessel at navigable speed and of being brought speedily into action in an emergency.

(4) Where power-operated main and connections are fitted in duplicate and each unit complies with the provisions of (3) no auxiliary steering unit need be fitted, provided that the duplicate units and connexions, operating together, comply with the requirements of (2).

(5) The main steering power unit shall be arranged to restart either by manual or automatic means when power is restored after a power failure.

(6) In the event of a power failure to any one of the steering gear power units, an audible and a visual alarm shall be given on the navigating bridge.

(7) The angular position of the rudder, if the main steering gear is power-operated, shall be indicated on the navigating bridge. The rudder angle indication shall be independent of the steering gear control system.

(8) Where a non-conventional rudder is installed, the Administration shall give special consideration to the steering system so as to ensure that an acceptable degree of reliability and effectiveness is provided.

(9) A means of communication shall be provided between the navigating bridge and the steering gear compartment.

*Communication* 55. (1) This regulation only applies where machinery spaces are manned under normal operating conditions

(2) Vessels shall be provided with at least two independent means for communicating orders between navigating bridge and the machinery space or control room from which the main propulsion engines are normally controlled. One of the means may be an engine-room telegraph.

(3) The engine-room telegraph referred to in (2) may be dispensed with if the main propulsion engine is directly controlled from the navigating bridge under normal operating conditions.

(4) In lieu of meeting the requirements of (2), vessels less than 24m in length may be provided with only one means for communication if it is demonstrated to the Administration that, due to the close proximity of the navigating bridge and the position of local control of the main propulsion machinery, two means of communication are not necessary.

(5) Appropriate means of communication shall be provided to any position (other than the navigating bridge) from which the engines may be controlled.

*Engineers' Alarm* 56. (1) An engineer's alarm shall be provided to be operated from the engine control room or at the manoeuvring platform as appropriate and shall be clearly audible in the engineers' accommodation. An engineer's alarm is not necessary if it is demonstrated that, due to particular manning patterns adopted in the engine room or the close proximity of the engine control room or the manoeuvring platform and the engineer's accommodation, the engineers can be alerted to emergency situations by other means.

## PART VI ELECTRICAL INSTALLATIONS

*Requirements* 57. Electrical installations on vessels and manned barges shall comply with the requirements of this Part, except as provided otherwise in regulation 60(11). All electrical installations shall be such that:

- (a) all electrical auxiliary services necessary for maintaining the vessel in normal operational and habitable conditions will be ensured without recourse to the emergency source of electrical power;

- (b) electrical services essential for safety will be ensured under various emergency conditions; on
- (c) the safety of passengers, crew and vessel from electrical hazards will be ensured.

*Precautions* 58. (1) Exposed metal parts of electrical machines or equipment which are not intended to be live but which are liable under fault conditions to become live shall be earthed unless the machines or equipment are:

- (a) supplied at a voltage not exceeding 55V direct current or 55V root mean square between conductors. Auto-transformers shall not be used for the purpose of achieving this voltage;
- (b) supplied at a voltage not exceeding 250V by safety isolating transformers supplying only one consuming device; or
- (c) constructed in accordance with the principle of double insulation.

(2) In confined or exceptionally damp spaces, where particular risks due to conductivity may exist, additional precautions shall be taken for the use of portable electrical equipment.

(3) All electrical apparatus shall be so constructed and so installed as not to cause injury when handled or touched in the normal manner.

(4) Main and emergency switchboards shall be so arranged as to give easy access as may be needed to apparatus and equipment, without danger to personnel. The sides and the rear and, where necessary, the front of switchboards shall be suitably guarded. Exposed live parts connected to AC power or having voltages to earth exceeding 30V DC shall not be installed on the front of such switchboards. Non-conducting mats or gratings shall be provided at the front and rear of the switchboard.

(5) The hull return system of distribution shall not be used for any purpose in a tanker or a barge carrying liquid cargoes of flammable nature in bulk.

(6) The requirement of (5) does not preclude, under conditions approved by the Administration, the use of:

- (a) impressed current cathodic protective systems;
- (b) limited and locally earthed systems (e.g. engine starting system);
- (c) limited and locally earthed welding systems; where the Administration is satisfied that the equipotential of the structure is assured in a satisfactory manner welding systems with hull return may be installed without the restriction imposed by (5); or
- (d) insulation level monitoring devices, provided the circulation current does not exceed 30mA under the most unfavourable conditions.

(7) Where the hull return system is used, all final sub-circuits, i.e. all circuits fitted after the last protective device, shall be two-wire and special precautions shall be taken to the satisfaction of the Administration.

(8) Earthed distribution system shall not be used in a tanker or barge carrying liquid cargoes of flammable nature in bulk. The Administration may permit the use of the following earthed systems:

- (a) power-supplied control circuits and instrumentation circuits where technical or safety reasons preclude the use of a system with no connection to earth, provided the current in the hull is limited to not more than 5A in both the normal and fault conditions;

- (b) limited and locally earthed systems, provided that any possible resulting current does not flow directly through any of the dangerous spaces; or
- (c) alternating current power network of 1000V root mean square (line to line) and over, provided that any possible resulting current does not flow directly through any of the dangerous spaces.

(9) When a primary or secondary distribution system, whether, for power, heating or lighting, with no connection to earth is used, a device capable of continuously monitoring the insulation level to earth and of giving an audible or visual indication of abnormally low insulation values shall be provided.

(10) All metal sheaths and armour of cables shall be electrically continuous and shall be earthed.

(11) All electric cables and wiring external to equipment shall be at least of a flame-retardant type and shall be so installed as not to impair their original flame-retarding properties. Special types of cables such as radio frequency cables that are necessary for particular applications need not comply with the foregoing.

(12) Cables and wiring serving essential or emergency power, lighting, internal communications or signals shall, so far as practicable, be routed clear of galleys, laundries, machinery spaces and their casings and other high fire risk areas. Cables connecting fire pumps to the emergency switch-board shall be of a fire-resistant type where they pass through high fire risk areas. Where practicable all such cables shall be run in such a manner as to preclude their being rendered unserviceable by heating of the bulkheads that may be caused by a fire in an adjacent space.

(13) Special precautions shall be taken where cables installed in hazardous areas could introduce the risk of fire or explosion in the event of an electrical fault in such areas.

(14) Cables and wiring shall be installed and supported in such a manner as to avoid chafing or other damage.

(15) Terminations and joints in all conductors shall be so made as to retain the original electrical, mechanical, flame-retarding and, where necessary, fire-resisting properties of the cables.

(16) Each separate circuit shall be protected against short circuit and against overload, except the circuit for the steering gear and where the Administration may exceptionally otherwise permit. The rating or appropriate setting of the overload protective device for each circuit shall be permanently indicated at the location of the protective device.

(17) Lighting fittings shall be so arranged as to prevent temperature rises which could damage the cables and wiring, and to prevent surrounding material from becoming excessively hot.

(18) All lighting and power circuits terminating in a bunker or cargo space shall be provided with a multiple-pole switch outside the space for disconnecting such circuits.

(19) Accumulator batteries shall be suitably housed, and compartments used primarily for their accommodation shall be properly constructed and efficiently ventilated.

(20) Electrical or other equipment, which may constitute a source of ignition of flammable vapours, shall not be permitted in compartments containing batteries, except as permitted in (22).

(21) Accumulator batteries except for batteries used in self-contained battery operated lights shall not be located in sleeping quarters unless they are hermetically sealed.

(22) No electrical equipment shall be installed in any space where flammable mixtures are liable to collect including those on board tankers or barge carrying liquid cargoes of flammable nature in bulk or in compartments assigned principally to accumulator batteries, in paint lockers, acetylene stores or similar spaces, unless it is demonstrated to the Administration that such equipment is:

- (a) essential for operational purposes;
- (b) of a type which will not ignite the mixture concerned;
- (c) appropriate to the space concerned; and
- (d) appropriately certified for safe usage in the dusts, vapours or gases likely to be encountered.

(23) Lightning conductors shall be fitted to all masts or topmasts constructed of non-conducting materials. In vessels constructed of non-conductive materials the lightning conductors shall be connected by suitable conductors to copper plate fixed to the vessel's hull well below the waterline.

*Main  
Source*

59. (1) A main source of electrical power of sufficient capacity to supply those services defined in regulation 57 shall be provided. This main source of electrical power shall consist of a generator driven by an internal combustion engine, which may be the main propulsion machinery of the vessel.

(2) A main electrical lighting system, which shall provide illumination throughout those parts of the vessel normally accessible to and used by passengers or crew, shall be supplied from the main source of electrical power.

(3) The arrangement of the main electric lighting system shall be such that a fire or other casualty in spaces containing the main source of electrical power, associated transforming equipment, if any, and the main switchboard will not render the emergency electric lighting system required by regulation 60(5) inoperative.

(4) The arrangement of the emergency electric lighting system shall be such that a fire or other casualty in spaces containing the emergency source of electrical power, associated transforming equipment, if any, and the emergency switchboard will not render inoperative the main electric lighting system required by (2).

*Emergency  
Source*

60. (1) A self-contained emergency source of electrical power, shall be provided.

(2) The emergency sources of electrical power, associated transforming equipment, if any, and the emergency switchboard shall be located above the uppermost continuous deck and shall be readily accessible from the

open deck. They shall not be located forward of the collision bulk-head, except where permitted by the Administration in exceptional circumstances.

(3) The location of the emergency source of electrical power associated transforming equipment, if any, and the emergency switchboard in relation to main source of electrical power, associated transforming equipment, if any, and the main switchboard shall be such as to ensure, to the satisfaction of the Administration, that a fire or other casualty in the space containing the main source of electrical power, associated transforming equipment, if any, and the main switchboard, or in any main machinery space will not interfere with the supply, control and distribution of emergency electrical power.

(4) Provided that suitable measures are taken for safeguarding independent emergency operation under all circumstances, the emergency generator may be used, exceptionally and for short periods, to supply non-emergency circuits.

(5) If the main source of power is single generating set driven by the main propulsion machinery of the vessel, the emergency source of power shall be capable of providing the electrical services necessary to start the main propulsion plant from the dead ship condition in addition to, and at the same time as, the services required to be provided by (6).

(6) The electrical power available shall be sufficient to supply all those services that are essential for safety in an emergency, due regard being paid to such services as may have to be operated simultaneously. The emergency source of electrical power shall be capable, having regard to starting currents and the transitory nature of certain loads, of supplying simultaneously at least the following services for the periods specified below, if they depend upon an electrical source for their operation:

***For a period of 3 hours***

emergency lighting at every assembly and embarkation station and over the sides in the way of such stations;

***For a period of 12 hours***

- (a) emergency lighting in all service and accommodation alleys, stairways and exits;
- (b) emergency lighting in spaces containing propulsion machinery used for navigation, if any, and main source of electrical power and their control positions;
- (c) emergency lighting in all control stations, machinery control rooms and at each main and emergency switchboard;
- (d) emergency lighting at all stowage positions for firemen's outfits;
- (e) emergency lighting at the steering gear compartment, if any
- (f) emergency lighting at the emergency fire pump and its control position;
- (g) the navigation lights and other lights required by COLREG;
- (h) all communication equipment as required for transmission of distress and safety messages, including the vessel's whistle and all internal communication equipment as required in an emergency;



- (i) fire detection and fire alarm systems; and
  - (j) operation of emergency fire pumps, if electrically operated.
- (7) In a vessel regularly engaged in voyages of short duration, the Administration, if satisfied that an adequate standard of safety would be attained, may accept a lesser period than the 12 hour period specified in (6) (a) to (i) inclusive but not less than 3 hours
- (8) The emergency source of electrical power may be either an accumulator battery capable of carrying the emergency electrical load without recharging or excessive voltage drop or a generator driven by a suitable prime mover with an independent fuel supply and starting to the satisfaction of the Administration.
- (9) Where the emergency source of electrical power is an accumulator battery:
- (a) it shall be capable of automatically connecting to the emergency switchboard in the event of failure of the main source of electrical power. Where an automatic connection to the emergency switchboard is not practical, manual connection may be acceptable to the satisfaction of the Administration; and
  - (b) the Administration may permit alternative means of meeting the requirements of (6) (g).
- (10) Where the emergency source of power is a generator, it shall be automatically started and connected to the emergency switchboard within 45 seconds of the loss of the main source of electrical power. It shall be driven by a prime mover with an independent fuel supply having a flash point of not less than 43°C. Automatic starting of the emergency generator will not be required where a transitional source of power to the satisfaction of the Administration is provided.
- (11) For vessels less than 24m in length certificated to undertake voyages in Inshore areas of operation, the Administration may waive any of the requirements of this regulation, which it considers to be impracticable.

## PART VII FIRE PROTECTION, FIRE DETECTION AND FIRE EXTINCTION

- |                          |  |
|--------------------------|--|
| <i>Applica-<br/>tion</i> | 61. Unless expressly provided otherwise, this Part shall apply to all vessels propelled by mechanical means and to manned barges 24m and above in length.  |
| <i>Fire<br/>Pumps</i>    | 62. (1) Every vessel between 15m and 24m in length shall be provided with at least one independent power-operated fire pump, capable of delivering a jet of water as required by regulation 63(4). |

(2) Every vessel 24m and above in length shall be provided with at least two independent power-operated fire pumps, capable of delivering a jet of water as required by regulation 63(4). One such pump shall be operated by means other than the propulsion machinery of the vessel.

(3) The capacity of one of the main fire pumps required by (1) and (2) shall not be less than 40 per cent of their total capacity.

(4) Sanitary, bilge, ballast or general service pumps may be accepted as fire pumps, provided that they are not normally used for pumping oil.

(5) Every fire pump shall be arranged to draw water directly from the sea and discharge into a fixed fire main. However, in vessels with high suction lifts, booster pumps and storage tanks may be installed, provided such arrangement satisfies all the requirements of this regulation.

(6) Centrifugal pumps or other pumps connected to the fire main through which back flow could occur shall be fitted with non-return valves.

(7) Where the fire pumps are capable of developing a pressure exceeding the design pressure of the fire mains, water service pipes, hydrants and hoses, relief valves shall be fitted. These valves shall be so placed and adjusted as to prevent excessive pressure in any part of the fire main system.

(8) Location and arrangement of pumps required for the provision of water for other fire extinguishing systems required by this Part, their sources of power and their controls shall be installed outside the space or spaces protected by such system and shall be so arranged that a fire in the space or spaces protected will not put any such system out of action.

(9) In respect of all vessels 24m and above in length, if a fire in any one compartment can put out of action the fire pumps fitted in accordance with (2), an emergency fire pump shall be fitted.

(10) The emergency fire pump shall be an independently driven self-contained pump either with its own prime mover and fuel supply fitted in an accessible position outside the compartment containing the main fire pumps or be driven by a self-contained generator of sufficient capacity, which may be the emergency generator referred to in regulation 60, and positioned in a safe place outside the engine room and above the freeboard deck.

(11) The emergency fire pump, sea suction and other valves shall be operable from outside the compartment containing the main fire pump and in a position not likely to be cut off by fire in that compartment.

(12) The capacity of the emergency pump shall not be less than 40 per cent of the total capacity of the fire pumps required by (1) and (2).

63. (1) A fire main shall be provided where more than one hydrant is required to provide a jet of water in accordance with the provision of (3).

(2) The diameter of the fire main and water service pipes shall be sufficient for the effective distribution of the maximum required discharge from the fire pump, or where more than one pump is provided the discharge from at least two pumps operated simultaneously. Such diameter need only be sufficient for a discharge of 100m<sup>3</sup>/h with a minimum pressure as indicated in (4).

(3) In a vessel where one or more main fire pumps is provided, the diameter of the fire main and of the water service pipes connecting the hydrants thereto shall be sufficient for the effective distribution of the maximum required discharge specified in (2).

(4) Where only one hydrant is required, the minimum pressure at the hydrant shall be 0.21 N/mm<sup>2</sup> (2.1 kg/cm<sup>2</sup>). Where more than one hydrant is required, the main fire pump shall be capable, when discharging the maximum amount through adjacent fire hydrants with nozzles of the sizes specified in regulation 64, of maintaining at all hydrants a minimum pressure of 0.21 N/mm<sup>2</sup> (2.1 kg/cm<sup>2</sup>). In any case, the maximum pressure at any hydrant shall not exceed that at which the effective control of a fire hose can be demonstrated.

(5) In every vessel, the number and position of hydrants shall be such that at least one jet of water from a single length of hose can reach any part of the vessel normally accessible to the crew while the vessel is being navigated and any part of any cargo space when empty. In the case of vessels propelled by mechanical means, in any ro-ro cargo or in any special category spaces at least two jets of water not emanating from the same hydrant shall reach any part of such, each from a single length of hose. Furthermore, such hydrants shall be positioned near the accesses to the protected spaces.

(6) Pipes and hydrants shall be so placed that the fire hoses may be easily coupled to them.

(7) Material readily rendered ineffective by heat shall not be used for fire mains and hydrants unless adequately protected.

(8) In vessels where deck cargo may be carried, the position of the hydrants shall be such that they are always readily accessible and the pipes shall be arranged as far as practicable to avoid risk of damage by such cargo.

(9) A valve shall be fitted to serve each fire hose so that any fire hose may be removed while the fire pumps are operating.

(10) On vessels of 24m and above in length, the fire mains shall be provided with isolating valves located so as to permit continued operation in the event of physical damage to any part of the main.

(11) Fire mains shall have no connections other than those required for fire fighting, except for the purposes of washing the deck and anchor chains or operating the chain locker bilge ejector.

64. (1) Every vessel upto 24m in length shall be provided with a minimum of one fire hose.
- (2) Every vessel 24m and above in length shall be provided with a minimum of two fire hoses.
- (3) Where hydrants are required in any machinery spaces, each hydrant shall be provided with a fire hose. Where practicable, fire hoses shall be connected to the hydrants in such machinery spaces.
- (4) Notwithstanding the requirements of (1), (2) and (3), the Administration may increase the required number of fire hoses so as to ensure that hoses in sufficient number are available and accessible at all times, having regard to the type of vessel and the nature of the trade in which the vessel is engaged.
- (5) A single length of fire hose shall not exceed 20m.
- (6) Fire hoses shall be oil-resistant and of approved material.
- (7) Fire hoses of unlined canvas shall have an internal diameter of not less than 64mm. Lined hoses of at least 45mm internal diameter having a through put comparable to that of 64mm internal diameter unlined canvas at corresponding pressure may be used. Fire hoses of an internal diameter not less than 32mm may be accepted in accommodation spaces of all vessels.
- (8) Unless one fire hose and nozzle is provided for each hydrant, fire hose couplings and nozzles shall be completely interchangeable.
- (9) Fire hoses provided in compliance with this regulation shall not be used for any purpose other than fire fighting or testing of the fire appliances.
- (10) Every fire hose shall be provided with an approved nozzle and the necessary couplings.
- (11) Nozzles shall comply with the following requirements:
  - (a) nozzle sizes shall be 12mm, 16mm, 19mm or as near thereto as possible. Larger diameter nozzles may be permitted at the discretion of the Administration;
  - (b) for accommodation and services spaces, a nozzle size greater than 12mm need not be used;
  - (c) for machinery spaces and exterior locations, the nozzle size shall be such as to obtain the maximum discharge possible from the required jets at the pressure specified in 7.3.4 from the required jets at the pressure specified in 7.3.4 from the smallest pump, provided that a nozzle size greater than 19mm need not be used.
- (12) In tankers, all nozzles provided for fire hoses shall be of an approved dual-purpose type (i.e. spray/jet type) incorporating a shutoff.

(13) In all ships all nozzles provided for fire hoses in machinery spaces and fire hoses serving spaces where dangerous goods are carried or stored shall be of an approved dual-purpose type (i.e. spray/jet type) incorporating a shut off.

(14) Where the administration so requires, vessels of 24m and above in length shall be provided with at least one international shore connection complying with Schedule X.

65. (1) All fire extinguishers shall be of approved types and designs.

*Portable  
Extinguishers*

(2) The capacity of required portable fluid extinguishers shall be not more than 13.5 litres and not less than 9 litres. Other portable fire extinguishers shall have a fire extinguishing capacity at least equivalent to that of a 9 litre fluid fire extinguisher.

(3) No portable fire extinguishers required by this regulation shall exceed 23kg in weight in a fully charged condition.

(4) Spare charges shall be provided for every portable fire extinguisher required except that, for each portable fire extinguisher of a type that cannot readily be recharged while the vessel is at sea, an additional fire extinguisher of the same type, or its equivalent, shall be provided in lieu of a spare charge.

(5) Fire extinguishers containing an extinguishing medium which, in the opinion of the Administration, either by itself or under expected conditions of use gives off toxic gases in such quantities as to endanger persons shall not be permitted.

(6) Fire extinguishers shall be periodically examined and subjected to tests as follows:

- (a) The condition of the charges of extinguishers other than carbon dioxide extinguishers, shall be checked annually. If on checking there is any indication of deterioration, the charges shall be renewed and, in any case, at least every four years. A record of the annual check is to be fixed to each fire extinguisher;
- (b) Carbon dioxide extinguishers and gas propellant cartridges of other extinguishers shall be examined annually for external corrosion and for loss of content. They shall be recharged or renewed if the loss of gas by weight exceeds 10 per cent of the original charge as stamped on the bottles or cartridge, or have excessive external corrosion;
- (c) All portable fire extinguishers, other than carbon dioxide extinguishers, shall be tested by hydraulic pressure once every four years and the date of such test legibly marked on the extinguisher;
- (d) New carbon dioxide extinguishers which do not require to be recharged shall be tested by hydraulic pressure twenty years after manufacture and thereafter every five years;

- (e) Carbon dioxide extinguishers which require recharging shall be pressure tested before being recharged if four years have elapsed since the last hydraulic test was carried out.
  - (7) One of the portable fire extinguishers intended for use in any space shall be stowed near the entrance to that space.
  - (8) Halon fire extinguishers shall not be used.
  - (9) Each fire extinguisher shall, as far as it is practicable, be clearly marked on the front with a label of durable material containing the following minimum information in English:
    - (a) name of manufacturer, year of manufacture and serial number;
    - (b) type of fire for which the extinguisher is suitable;
    - (c) type and quantity of extinguishing medium;
    - (d) approval details;
    - (e) pictorial and legible operating instructions;
    - (f) intervals for recharging;
    - (g) temperature range over which the extinguisher will operate satisfactorily;
    - (h) test pressure;
    - (i) date last tested; and
    - (j) date of last inspection.
66. (1) Portable fire extinguishers shall be provided as required under (2) to (10) inclusive. The Administration may permit a lesser number of portable fire extinguishers to be provided where the size or arrangement of the vessel is such that a lesser number will result in an equivalent level of safety.
- (2) In every vessel there shall be provided a sufficient number of approved portable fire extinguishers to ensure that at least one extinguisher will be readily available for use in any part of accommodation spaces and service spaces. The arrangement of the fire extinguishers shall be to the satisfaction of the Administration.
- (3) In vessels 45m and above in length, at least 3 portable fire extinguishers shall be provided in each separate structure containing accommodation spaces and service spaces.
- (4) In vessels less than 45m in length, at least 3 portable fire extinguishers shall be provided in each separate structure containing accommodation spaces and service spaces.
- (5) In all vessels at least one portable fire extinguishers shall be provided at the entrance to the galley space.
- (6) At least 2 portable fire extinguishers shall be provided in the main machinery space of a vessel, one of which shall be located at or near the entrance to the space.
- (7) Where oil-fired boilers are installed in a vessel to provide auxiliary steam, one portable fire extinguisher shall be provided for each oil-fired boiler.

(8) Where oil-fired boilers are installed in a vessel to provide steam for the main propulsion machinery, the cargo pumps or the factory services of the vessel, at least 2 portable fire extinguishers shall be provided for each oil-fired boiler.

(9) Each vessel shall carry a total number of extinguishers in the machinery spaces to provide for all potential fire hazards arising in those spaces.

(10) In every vessel, where electrical installations fitted in accommodation, service, machinery and control stations constitute a fire or explosion hazard, additional fire extinguishers suitable for extinguishing electrical fires shall be provided.

*Fixed Systems*

67. (1) Fixed halogenated hydrocarbon fire-extinguishing systems shall not be used in any vessels.

(2) Subject to the provisions of (1), fixed fire-extinguishing systems required by this Part shall comply with the relevant requirements of the Administration.

*Vessels 24m and above*

68. (1) Where the Administration so requires, except in the case of fishing vessels, machinery spaces containing main or auxiliary oil-fired boilers or fuel oil units shall be provided with a fixed fire-extinguishing system approved by the Administration. In addition, if the engine and boiler rooms are not entirely separate, or if fuel oil can drain from the boiler room into the engine room, the combined boiler and engine rooms shall be considered as one compartment and shall be provided with:

- (a) at least one portable extinguisher suitable for extinguishing oil fires for each burner. However, the total capacity of such extinguishers shall not be less than 18 litres or equivalent and need not exceed 45 litres or equivalent in each boiler room;
- (b) at least two portable extinguishers suitable for extinguishing oil fires in each space in which an oil fuel unit is situated; and
- (c) a receptacle containing not less than 15m<sup>3</sup> of sand, saw-dust impregnated with soda or other approved dry material to the satisfaction of the Administration in each firing space. Alternatively, an approved portable extinguisher may be substituted.

(2) Where the Administration so requires, machinery spaces having a total power output of 75kW and above shall be provided with:

- (a) one of the fixed fire-extinguishing systems referred to in regulation 67; and
- (b) a number of portable fire extinguishers suitable for extinguishing oil fires equivalent to 2+ (engine power output in kW) 187.5, rounded to the nearest whole number, the total number of such fire extinguishers not exceeding six.

(3) Where the Administration so requires, machinery spaces containing internal combustion type machinery having a total power output of less than 750kW shall be provided with:

- (a) a number of portable fire extinguishers suitable for extinguishing oil fires equivalent to  $2 + (\text{engine power output in kW}) / 187.5$ , rounded to the nearest whole number, the total number of such fire extinguishers not exceeding six; or
- (b) such other arrangements as the Administration consider adequate.

(4) Where the Administration so requires, machinery spaces containing electrical installations shall be provided with one or more fire extinguishers suitable for extinguishing electrical fire as deemed necessary by the Administration having regard to the fire hazards of electrical origin. One or more of the fire extinguishers required by (1), (2) and (3) may serve, as the fire extinguishers required by this provision.

(5) Where, in the opinion of the Administration a fire hazard exists in any machinery space for which no specific provision for fire-extinguishing appliances is prescribed in (1) to (4) inclusive, there shall be provided in, or adjacent to, that space a number of approved portable fire extinguishers or other means of fire extinction to the satisfaction of the Administration.

69. (1) Every vessel 35m and above in length propelled by mechanical means shall be provided with a fireman's outfit. Every tanker 45m and above in length shall be provided with two fireman's outfits. Fi  
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- (2) A fireman's outfit shall consist of personnel equipment comprising:
  - (a) protective clothing of material to protect the skin from the heat radiating from the fire and from burns and scalding by steam. The outer surface shall be water-resistant;
  - (b) boots and gloves of rubber or other electrically non-conducting material;
  - (c) a rigid helmet providing effective protection against impact;
  - (d) an electric safety lamp (hand lantern) of an approved type with a minimum burning period of three hours;
  - (e) a hand axe to the satisfaction of the Administration; and
  - (f) a breathing apparatus of an approved type.

(3) The breathing apparatus required by (2)(f) shall be a smoke helmet or smoke mask, provided with a suitable air pump and a length of air hose sufficient to reach from the open deck, well clear of hatches or doorways, to any part of the holds or machinery spaces. If in order to comply with this provision an air hose exceeding 36m in length would be necessary, a self-contained breathing apparatus shall be substituted or provided in addition as determined by the Administration.

(4) As an alternative to (3), the breathing apparatus required by (2)(f) may be a self-contained compressed-air-operated breathing apparatus the volume of air contained in the cylinders of which shall be at least 1200 litres, or other self-contained breathing apparatus which shall be capable of functioning for at least 30 minutes. The equivalent of 2 spare charges, suitable for use with the apparatus provided, shall be available on board.

(5) For each breathing apparatus a fireproof lifetime of sufficient length and strength shall be provided, capable of being attached by means of a snaphook to the harness of the apparatus or to a separate belt in order to prevent the breathing apparatus becoming detached when the lifetime is operated.



(6) The Administration may require the carriage of additional sets of personal equipment and breathing apparatus, having due regard to the size and type of the vessel.

(7) The fireman's outfits or sets of personal equipment shall be so stored as to be easily accessible and ready for use and, where

(4) Where the Administration so requires, machinery spaces containing electrical installations shall be provided with one or more fire extinguishers suitable for extinguishing electrical fire as deemed necessary by the Administration having regard to the fire hazards of electrical origin. One or more of the fire extinguishers required by this provision

(5) Where, in the opinion of the Administration a fire hazard exists in any machinery space for which no specific provision for fire-extinguishing appliances is prescribed in (1) to (4) inclusive, there shall be provided in, or adjacent to, that space a number of approved portable fire extinguishers or other means of fire extinction to the satisfaction of the Administration.

69. (1) Every vessel 35m and above in length propelled by mechanical means shall be provided with a fireman's outfit. Every tanker 45m and above in length shall be provided with two fireman's outfits.

*Fireman's  
Outfit*

- (2) A fireman's outfit shall consist of personnel equipment comprising:
- (a) protective clothing of material to protect the skin from the heat radiating from the fire and from burns and scalding by steam. The outer surface shall be water-resistant;
  - (b) boots and gloves of rubber or other electrically non-conducting material;
  - (c) a rigid helmet providing effective protection against impact;
  - (d) an electric safety lamp (hand lantern) of an approved type with a minimum burning period of three hours;
  - (e) a hand axe to the satisfaction of the Administration; and
  - (f) a breathing apparatus of an approved type.

(3) The breathing apparatus required by (2)(f) shall be a smoke helmet or smoke mask, provided with a suitable air pump and a length of air hose sufficient to reach from the open deck, well clear of hatches or doorways, to any part of the holds or machinery spaces. If in order to comply with this provision an air hose exceeding 36m in length would be necessary, a self-contained breathing apparatus shall be substituted or provided in addition as determined by the Administration.

(4) As an alternative to (3), the breathing apparatus required by (2)(f) may be a self-contained compressed-air-operated breathing apparatus the volume of air contained in the cylinders of which shall be at least 1200 litres, or other self-contained breathing apparatus which shall be capable of functioning for at least 30 minutes. The equivalent of 2 spare charges, suitable for use with the apparatus provided, shall be available on board.

(5) For each breathing apparatus a fireproof lifetime of sufficient length and strength shall be provided, capable of being attached by means of a snaphook to the harness of the apparatus or to a separate belt in order to prevent the breathing apparatus becoming detached when the lifetime is operated.

- (6) The Administration may require the carriage of additional sets of personal equipment and breathing apparatus, having due regard to the size and type of the vessel.
- (7) The fireman's outfits or sets of personal equipment shall be so stored as to be easily accessible and ready for use and, where more than one fireman's outfits or more than one set of personnel equipment is carried, they shall be stored in widely separated positions. The location of fireman's outfits or sets of personal equipment shall be clearly marked outside the compartment in which they are stored.
70. Every vessel shall be provided with at least one fireman's axe placed in a case having breakable glass in an easily accessible location the machinery, accommodation and service spaces. F.
71. (1) In vessels 35m and above in length having main machinery spaces there shall be provided a permanently exhibited fire control plan or equivalent to the satisfaction of the Administration, which shall show for each deck of the vessel:
- (a) position of the control station(s);
  - (b) locations of all fire resistant and fire retardant bulkheads;
  - (c) particulars and locations of fire detection and fire extinction systems;
  - (d) location of the fireman's outfit(s);
  - (e) location of fire extinguishing appliances;
  - (f) means of access to various compartments and decks in the vessel;
  - (g) particulars of ventilation systems, including the positions of dampers and master ventilation controls;
  - (h) location and means of control of fuel pumps within and outside machinery spaces.
- (2) In all such vessels, the fire control plan shall be kept up-to-date. Description in such plans shall be in a language or languages approved by the Flag State and in the English language.
- (3) In addition to the fire control plan, instructions concerning the maintenance and operation of all the equipment and installations on board for the fighting and containment of fire shall be kept under one cover, readily available in an accessible position. Such instructions shall be published in the working language of the vessel.
72. (1) Except where expressly provided, in vessels less than 24m in length the provisions specified in this Part may be relaxed to the extent as specified below except that no relaxation shall be granted to vessels carrying dangerous goods as defined in SOLAS Chapter VII, reproduced in Schedule XI. Ver  
the
- (2) In lieu of the provisions specified in regulation 62(1) and 62(2), in vessels propelled by mechanical means, fire pumps may be driven by the main propulsion machinery, provided that the propeller can be readily disconnected or that a controllable pitch propeller is fitted;

(3) In lieu of the provisions specified in 64(6), fire hoses of an internal diameter of not less than 32mm may be accepted;

(4) Where fire protection requirements are relaxed in accordance with (2) or (3), vessels shall be provided with at least three fire buckets having a capacity of at least 9 litres made of a material which is not readily flammable. They shall be painted red, clearly marked with word "FIRE" and provided with lanyards of sufficient length, having regard to the size of the vessel. Fire buckets shall not be used for any purpose other than extinguishing fire.

(5) Where the provision of fixed fire extinguishing systems is considered to be impracticable the Administration may accept alternate arrangements.

73. (1) In vessels 24m and above in length, where the Administration so requires, a fixed fire detection and fire alarm system shall be fitted in all main machinery spaces, accommodation spaces and cargo holds. *Detect System*
- (2) The fixed fire detection and fire alarm system shall be of a type approved by the Administration.
74. Where in this Part a type of appliance, apparatus, extinguishing medium or arrangement is specified, any other type of appliance may be allowed provided the Administration is satisfied that it is not less efficient. *Substit*

## PART VIII FIRE SAFETY MEASURES

75. (1) This Part applies to vessels propelled by mechanical means and to manned barges having main machinery spaces. *Applica*
- (2) Vessels and manned barges having machinery spaces other than main machinery spaces shall comply with the provisions of this Part to the satisfaction of the Administration.
- (3) The Administration may require fire safety measures to be applied to unmanned barges having a machinery space.
76. (1) The hull, superstructures, structural bulkheads, decks and deck houses of vessels propelled by mechanical means shall be constructed of steel, wood or other equivalent material. *Structur Protecti*
- (2) The bulkheads and decks separating the main machinery spaces from control stations, corridors, accommodations spaces, stairways, service spaces and cargo spaces shall be so constructed as to be capable of preventing the spread of fire to the unexposed side. Structural fire protection shall be fitted to the satisfaction of the Administration.
- (3) Insulation materials in accommodation spaces, services spaces; control stations and machinery spaces, except domestic refrigeration compartments, shall be non-combustible. Vapour barriers and adhesive used in conjunction with insulation, as well as insulation of pipe fittings for cold service systems, need not be non-combustible materials, but they shall be kept to the minimum quantity practicable and their exposed surfaces shall have qualities of resistance to the propagation of flame to the satisfaction of the Administration.

(4) All exposed surfaces in corridors and stairway enclosures and surfaces, including grounds and supporting structure for such surfaces, in concealed or inaccessible places in accommodation space, service spaces and control stations shall have low flame-spread characteristics. Exposed surfaces of ceilings in accommodation spaces, service spaces and control stations shall have low flame-spread characteristic.

(5) Paints, varnishes and other finishes used on exposed interior surfaces shall be demonstrated not to offer an undue fire hazard and not to produce excessive quantities of smoke.

(6) Primary deck coverings, if applied within accommodation spaces, service spaces and control stations, shall be of approved materials, which will not readily ignite or give rise to toxic or explosive hazards at elevated temperatures. In existing vessels, the Administration may, in lieu of applying the requirements fully, apply such requirements only to deck coverings within accommodation spaces on decks forming the crown of machinery spaces and cargo spaces.

77. (1) Stairways and ladders shall be so arranged as to provide ready means of escape from all accommodation spaces and from spaces, other than machinery spaces, in which the crew is normally employed to the open deck and from there to the survival craft; *Meas.*

(2) Two means of escape, as widely separated as possible, shall be provided from main machinery spaces. Vertical escapes shall be by means of steel ladders or other means acceptable to the Administration. Where the size of such machinery space makes it impracticable, one of these means of escape may be dispensed with provide that the exit is to the satisfaction of the Administration;

(3) Escape routes from machinery spaces other than main machinery spaces shall be provided to the satisfaction of the Administration having regard to the nature and location of the spaces and whether persons are normally employed in such spaces;

(4) Corridors and parts of corridors from which there is only one escape route are prohibited. Notwithstanding this prohibition, an Administration may permit such a dead-end corridor if it determines that it is necessary for the proper functioning of the ship;

(5) The width and continuity of the means of escape shall be to the satisfaction of the Administration.

78. Where the Administration considers it necessary, the following provisions shall apply to main machinery spaces and to other machinery spaces. *Ventil. Contr.*

(1) Means of control shall be provided for the opening and closing of skylights, closing of openings in funnels which normally allow exhaust ventilation, and closing of ventilator dampers.

(2) Means of control shall be provided for permitting the release of smoke.

(3) Means of control shall be provided for stopping forced and induced draught fans, fuel oil transfer pumps, fuel oil unit pumps and similar fuel pumps.

(4) Controls required in (1), (2) and (3) shall be located outside the space concerned so that they will not be cut off by fire in the space they serve.

(5) The number of skylights, doors, ventilators for natural ventilation, openings in funnel to permit exhaust ventilation and other openings to machinery spaces shall be in accordance with requirements of regulation 51.

(6) Skylights shall not contain glass panels. However, skylights containing wire-reinforced glass or toughened safety glass panels may be permitted provided that they are fitted with external shutters of steel or other equivalent material permanently attached. Suitable arrangements shall be made to permit the release of smoke in the event of fire from the spaces to be protected.

(7) Windows shall not be fitted in machinery space boundaries. This does not preclude the use of glass for windows in control rooms within the machinery space.

(8) Doors fitted in machinery space boundaries shall as far as practicable have equivalent fire resistance to the divisions forming such boundaries. If such doors are not weather-tight or watertight, they shall be self-closing.

(9) Ventilation systems of each of the following groups of spaces shall be completely separated from each other:

- (a) machinery spaces;
- (b) galleys;
- (c) cargo spaces; and
- (d) accommodation spaces and control stations.

(10) The arrangement of each of the ventilation systems in (9) shall be such that fire in one space served by the system shall not readily spread to other spaces served by the system.

(11) Power ventilation of accommodation spaces, services spaces, cargo spaces, control stations and machinery spaces shall be capable of being stopped from an easily accessible position located outside the space being served. This position shall not be located so that it could be cut off in the event of a fire in the space served. The means provided for stopping the power ventilation of machinery spaces shall be entirely separated from the means provided for stopping ventilation of other spaces.

(12) The main inlets and outlets of all ventilation systems shall be capable of being closed from outside the spaces being ventilated.

79. (1) Subject to the provisions of regulations 85 and 87, all tanks, cofferdams and other enclosed spaces where dangerous vapours are liable to be trapped shall be provided with effective means for ventilation and access, having regard to the intended services of the vessel.

*Ventilation  
Tanks And  
Dams*

(2) In tankers and barges carrying flammable liquid cargo in bulk (other than crude oil or petroleum products of low flashpoint) there shall be provided for ventilation of cargo tanks a venting system consisting of one or more pressure/vacuum valves at the outlets to the atmosphere or air pipes, the open ends of which are fitted with removable wire gauze diaphragms of non-corrosive material. Such venting systems shall be demonstrated to be effective in relation to the range of cargoes to be carried by the vessel.

80. (1) Where bulkheads, decks, ceilings or linings are penetrated for the passage of electric cables, pipes, trunks, etc. or for the fitting of ventilation terminals, lighting fixtures and similar devices, or for girders, beams or other structural members, arrangements shall be made to ensure that the fire integrity is not impaired. *On.*
- (2) The Administration may permit pipes carrying oil and combustible liquid to pass through accommodation and service spaces provided that they are not concealed and are of an appropriate material having regard to the fire risk.
- (3) Material readily rendered ineffective by heat shall not be used for overboard scuppers including sanitary discharges and other outlets which are close to the water-line and where the failure of the material in the event of fire would give rise to danger of flooding.
- (4) Electric radiators, if used, shall be fixed in position and so constructed as to reduce fire risks to a minimum. No such radiators shall be fitted so that clothing, curtains, or other similar materials can be scorched or set on fire by heat from any part of the radiator.
- (5) Paint lockers and similar compartments used for the storage of flammable liquids shall be separated from adjacent compartments by non-combustible divisions. In the case of divisions constructed of materials other than steel, the insulated surface of the division shall be inside the high-risk compartment.
- (6) In spaces where penetration of oil products is possible, the surface of all insulation shall be impervious to oil or oil vapour.
- (7) All main and auxiliary machinery exhaust pipes shall be kept clear of, or insulated in way of, combustible material.
- (8) Survival craft shall be protected from fire hazards. Where a Survival craft is stowed directly above an area of fire hazard, either the deck shall be constructed to comply with A-15 or B-15 structural fire protection standards or the deck in way of the survival craft shall be insulated to an equivalent standard.
- (9) Where the Administration considers it necessary, fire protection arrangements in cooking spaces shall be in accordance with following:
- (a) in the case of a small cooking area that is common with the accommodation, the structural fire protection fitted shall be dependent on the fire hazard presented by the cooking appliances in the area.
- (b) cooking appliances such as deep-fat fryers or other appliances presenting a high fire hazard are not permitted unless the compartment in which they are situated is fitted with a fixed fire extinguishing system;
- (c) suitable fire retardant barriers shall be built around the cooking and heating appliances where they are adjacent to combustible materials and structures;

- (d) cooking range exhaust hoods and ducts shall be fitted with a trap;
  - (e) combustible materials not needed in the cooking area shall not be stored in the area; and
  - (f) open gas flame appliances, other than cooking stoves, domestic refrigerations or water heaters are not permitted. Spaces containing any such stoves or water heaters shall have adequate ventilation to remove fumes and possible gas leakage to a safe space. All pipes conveying gas from a container to an appliance shall be of steel or other appropriate material. Automatic safety gas shut-off devices shall be fitted to operate on loss of pressure in the gas main pipe or flame failure on any appliance.
81. (1) (a) except as otherwise permitted by (1) and regulation 88, no oil fuel with a flash point of less than 60°C shall be used; *Oil Fuel*
- (b) in emergency generators oil fuel with a flashpoint of not less than 43°C may be used.
  - (c) subject to such additional precautions as it may consider necessary, and on condition that the ambient temperature of the space in which such oil fuel is stored or used shall not be allowed to rise to within 10°C below the flash point of the oilfuel, the Administration may permit the general use of oil fuel having a flashpoint of less than 60°C but not less than 43°C;
  - (d) in cargo vessels the use of fuel having a lower flashpoint than otherwise specified in (1), for example crude oil, may be permitted provided that such fuel is not stored in any machinery space and subject to the approval by the Administration of the complete installation; and
  - (e) the flashpoint of oils shall be determined by an approved closed cup method.
- (2) In vessels of 35m and above in length and any other vessel designated by the Administration, in which oil fuel is used, the arrangement for the storage, distribution and utilization of the oil fuel shall be such as to ensure the safety of the vessel and persons on board and shall at least comply with the following provisions:
- (a) as far as practicable, parts of the oil fuel systems containing heated oil under pressure exceeding 0.18 N/mm<sup>2</sup> shall be placed in an open position such that defects and leakage can readily be observed. The machinery spaces in way of such parts of the oil fuel system shall be adequately illuminated;
  - (b) as far as practicable, oil fuel tanks shall be part of the vessel's structure and shall be located outside main machinery spaces. Where oil fuel tanks, other than double bottom tanks, are necessarily located adjacent to or within main machinery spaces, at least one of their vertical sides shall be contiguous to the machinery space boundaries, and shall preferably have a common boundary with the double bottom tanks where fitted. In addition, the area of the tank boundary common with the machinery spaces shall be the minimum practicable. Where such tanks are situated within the boundaries of main machinery spaces they shall not contain oil fuel having a flashpoint of less than 60°C. The use of free standing oil fuel tanks is not permitted, unless they are placed in an oil-tight spill tray of ample size having a suitable drain pipe leading to a safe place;

- (c) every oil fuel pipe which, if damaged, would allow oil to escape from a storage, settling or daily service tank situated above the double bottom shall be fitted with a quick-acting cock or valve directly on the tank capable of being closed from a safe position outside the space concerned in the event of a fire occurring in the space in which such tanks are situated. Tanks of not more than 250 litres capacity need not comply with this provision;
  - (d) safe and efficient means of ascertaining the amount of oil fuel contained in any oil fuel tank shall be provided. Sounding pipes shall not terminate in any space where risk might arise from ignition of a spillage from the sounding pipe. In particular, they shall not terminate in accommodation spaces. Other means of ascertaining the amount of oil fuel contained in any fuel tank may be permitted, provided that the failure of such means or overfilling of the tanks will not permit release of fuel. The Administration may permit the use of oil level gauges with flat glasses and self-closing valves between the gauges and fuel tanks. Cylindrical gauge glasses may also be permitted in free-standing oil fuel tanks provided that they are suitable protected and fitted with self-closing valves to the satisfaction of the Administration; and
  - (e) provision shall be made to prevent over-pressure in any oil tank or in any part of the oil fuel system, including the filling pipes. Relief valves and air or overflow pipes shall discharge to a safe position. The open ends of air pipes shall be fitted with removable wire gauze diaphragms of non-corrosive material.
- (3) The arrangements for storage, distribution and utilization of oil used in pressure lubrication systems shall be such as to ensure the safety of the vessel and persons on board. The arrangements in main machinery spaces, and whenever practicable in other machinery spaces, shall at least comply with the provisions of (2)(a), (c), (d) and (e) as they apply to oil fuel arrangements, except that this does not preclude the use of sight-flow glasses in lubricating systems provided that they have been demonstrated to have a suitable degree of fire resistance.
- (4) The arrangements for storage, distribution and utilization of other flammable oils employed under pressure in power transmission systems, control and activation systems and heating systems shall be such as to ensure the safety of the vessel and persons on board. In locations where means of ignition are present, such arrangements shall at least comply with the provisions of (2)(d) and (2)(e) in respect of strength and construction.
82. No oil fuel tank or lubricating oil tank or any other flammable oil tank shall be situated where spillage or leakage therefrom can constitute a hazard by falling on heated surfaces. Precautions shall be taken to prevent any oil that may escape under pressure or oil leakage from any pump, filter, piping system or heat exchanger from coming into contact with heated surfaces or enter into machinery air intakes. Where necessary, a suitable spill tray or gutter screen or other suitable arrangement shall be provided to allow oil to drain to a safe place in the event of spillage or leakage of oil from such an oil tank, machinery, equipment or system. The number of joints in piping systems shall be kept to the minimum practicable.

*Spi*  
*Leu*



83. Pipes, fittings and valves handling fuel oil, lubrication oil and other flammable oils shall be of steel or other approved material, except that restricted use of flexible pipes shall be permissible in positions where the administration is satisfied that they are necessary. Such flexible pipes and end attachments shall be of approved fire-resisting materials of adequate strength and shall be constructed to the satisfaction of the Administration. *Pipes & Fitt.*
84. (1) Oil fuel, lubrication oil and other liquid substances that are flammable or may be harmful to the marine environment shall not be carried in forepeak tanks. *Forepeaks*
- (2) Oil fuel, lubrication oil and other liquid substances that are flammable or may be harmful to the marine environment shall not be carried in other tanks or spaces unless they have been specially approved by the Administration for such purposes.
85. Where more than one cylinder of oxygen and more than one cylinder of acetylene are carried simultaneously, such cylinders shall be arranged in accordance with the following: *Gas Cylinders*
- (1) Permanent piping systems for oxyacetylene and acetylene may be accepted provided that they are designed having due regard to standards and codes of practice acceptable to the Administration.
- (2) Where two or more cylinders of each gas are intended to be carried in enclosed spaces, separate dedicated storage rooms shall be provided for each gas.
- (3) Storage rooms shall be constructed of steel, and be well ventilated and accessible from the open deck.
- (4) Provision shall be made for the expeditious removal of cylinders from the storage rooms in the event of fire.
- (5) "NO SMOKING" signs shall be displayed at the gas cylinder storage rooms.
- (6) Where cylinders are stowed in open locations, means shall be provided to:
- (a) protect cylinders and associated valves, pressure regulators and piping from physical damage;
  - (b) minimize exposure to hydrocarbons;
  - (c) ensure suitable drainage; and
  - (d) protect the cylinders against excessive variations in temperature and the direct rays of the sun.
- (7) In all cases, cylinders and associated piping shall be located at a safe distance from the vessel's sides to avoid leakage of gases due to damage to the cylinders in the case of an accident to the vessel's side.
- (8) Cylinders of compressed, liquefied or dissolved gas shall:
- (a) be clearly marked by means of identifying colours;
  - (b) have a clearly legible identification of the name and chemical formula of their contents; and
  - (c) be properly secured.
- (9) Fire-extinguishing arrangements for the protection of areas or spaces where such cylinders are stored shall be to the satisfaction of the Administration.

86. (1) Stowage of explosives associated with vessel's use shall be in accordance with the requirements for explosives storage specified in Chapter 7 of the Code of Safety For Special Purpose Ships (SPS Code) adopted by the Organization by Resolution A.534(XIII), as amended from time to time.
- (2) Subject to the provisions of paragraph 2 of regulation 11 of the SPS Code, liquids, which give off dangerous vapours and flammable gases and cylinders containing flammable or other dangerous gases, shall be stored in a well ventilated space or on deck and protected against sources of dangerous heat. All pipes and fittings associated with gas cylinders shall be adequately protected against damage. Where storage rooms are necessary, separate storage rooms meeting the requirements of the IMDG Code shall be provided.
- (3) Substances that are liable to spontaneous heating or combustion shall not be carried unless adequate precaution has been taken to prevent the outbreak of fire.
- (4) Radioactive substances shall not be carried unless adequate precautions have been taken to the satisfaction of the Administration.
87. (1) Where vessels are engaged in the carriage of dangerous goods, a fixed gas fire-extinguishing system in accordance with the requirements of the Administration shall be provided in the cargo spaces to give appropriate protection to the cargoes carried and a portable fire extinguisher shall be located near to the entrance to the hold.
- (2) In addition to complying with the applicable requirements of (1), vessels intended for the carriage of dangerous goods shall comply with the special requirements specified in regulation 54 of Chapter II-2 of SOLAS 74, except when carrying dangerous goods in limited quantities.
- (3) The Administration may modify the requirements of (1) and (2) according to the nature of the service of the vessel and the risks associated with its operation, taking into account the safety of persons on board, the safety of property at sea and protection of the marine environment from pollution.
- (4) The Administration shall provide the vessel with an appropriate document as evidence of compliance with the applicable provisions of this regulation relating to construction and equipment.
88. Notwithstanding the requirements of regulation 81, petrol driven outboard motors may be fitted to vessels. The arrangements for the motors and fuel systems shall be as follows:
- (1) The engine or engines shall be securely fastened to the hull.
- (2) If the engine or engines are not permanently secured to the hull, a safety chain or cable shall be fitted.
- (3) engine wells shall be effectively drained and shall permit the engine to be tilted up.
- (4) Petrol for use in outboard motors shall be stored in portable containers of substantial construction that can be readily jettisoned.

- (5) As an alternative to (4) petrol may be stored in a fixed inboard tank, provided that:
- (a) the vessel has a rigid hull;
  - (b) the tank is constructed of steel or stainless steel with rounded corners and edges;
  - (c) the tank is located in a safe place on board the vessel;
  - (d) the tanks is specially protected against fire and explosion;
  - (e) the opening of the vent pipe from the tank is protected by a flash proof fitting; and
  - (f) a hydrocarbon gas detector is fitted under or adjacent to the tank in a position where there is a likelihood of accumulation on hydrocarbon vapour.

*Tankers*

89. (1) The requirements of Regulations 56 to 63 of Chapter II-2 of SOLAS 74 shall apply to all tankers and barges carrying crude oil and petroleum products having a flashpoint not exceeding 60°C (closed cup test), as determined by an approved flash point apparatus and a Reid vapour pressure which is below atmospheric pressure and other liquid products having a similar fire hazard.

(2) In lieu of complying with the requirements of 8.14.1, existing tankers may comply with the requirements of the national regulations previously in force taking into account the safety of persons on board, the safety of property at sea and protection of the marine environment from pollution.

*Dangerous Goods*

90. (1) The requirements of Chapter VII of SOLAS 74 shall apply to the carriage of dangerous goods classified in regulation 2 of that Chapter, which are carried in vessels and barges in packaged form or in solid form in bulk as appropriate.

(2) The Administration may apply the requirements of (1) according to the service characteristics of the vessel and the risks associated with its operations, taking into account the safety of persons on board, the safety of property at sea and protection of the marine environment from pollution.

(3) Schedule XI reproduces the provisions of Part A of Chapter VII of SOLAS 74.

## PART IX LIFE SAVING APPLIANCES

*Application*

91. (1) Unless expressly provided otherwise, this Part applies to new cargo vessels, new cargo-passenger vessels, new passenger vessels and new manned barges.

(2) Life-saving appliances on existing vessels shall be in compliance with recognized standards. Survival craft and their launching appliances shall provide capacity for 100 per cent of the vessel's complement. Where the life-saving appliances and their launching appliances, where applicable, are not accessible from both sides of the vessel, additional life-saving appliances shall be fitted as required by the Administration.

- (3) Existing vessels shall, no later than two year after the entry into force of these Regulations, comply with the requirements of this Part and Part X relating to the following lifesaving equipment:
- (a) life jackets;
  - (b) lifebuoys;
  - (c) radar transponders;
  - (d) life rafts and hydrostatic release units;
  - (e) locating equipment specified under the GMDSS.
- (4) In respect of equipment other than that specified in (3) the Administration may, having regard to the safety of persons on board, require that existing vessels comply with the requirements of the Regulations.
92. (1) Life-saving requirements specified in this Part for ships certificated to undertake voyages in Unlimited areas of operation shall comply with the technical specifications of the International Life-Saving Appliance Code defined in Chapter II of SOLAS 74, hereinafter called the LSA Code. *Gen.* Where detailed requirements are not specified the life-saving appliances shall be to the satisfaction of the Administration.
- (2) The administration may approve lifeboats, life rafts, open reversible life rafts, buoyant apparatus and lifebuoys complying with the requirements of Schedules XII, XIII, XIV and XV as appropriate, in place of survival craft and other life-saving appliances complying with the requirements of the LSA Code, depending on the size and service characteristics of the vessel and the sea areas within which the vessel is certificated to undertake voyages, the proximity of its proposed routes to rescue facilities and prevailing weather conditions, provided that the safety of survivors will not be adversely affected by the substitution.
93. (1) Life-saving appliances and arrangements required by this Part shall be approved by the Administration or by other Administrations or classification societies as decided by the Administration. In approving life-saving appliances and arrangements the Administration shall ensure that such life-saving appliances and arrangements have regard to the recommendations of the Organization or to the provisions of any other national or international standards considered appropriate by the Administration. *Appn.*
- (2) Where novel life-saving appliances or arrangements are to be approved, the Administration shall ensure that they provide the same safety standards as specified in this Part and that such appliances and arrangements are evaluated and tested in accordance with the recommendations of the Organization.
94. In addition to the radio communications equipment required by Part X, the Administration may require that the following equipment be carried. *Comm.*
- (1) At least 4 rocket parachute flares and 4 hand-held distress flares located on the bridge of the vessel. Taking into consideration the nature and conditions of the voyage, the Administration may accept hand-held distress flares in lieu of rocket parachute flares. Parachute flares shall comply with the requirements of the LSA Code. Hand-held distress flares shall comply with Schedule XVI.
- (2) At least 4 hand-held smoke signals complying with Schedule XVI.

(3) An effective emergency means of communication for two-way communications between control stations, assembly and embarkation stations and strategic positions on board.

95. (1) Every vessel and manned barge 24m and above in length shall carry *Pers appl* at least four lifebuoys complying with the requirements of (2), and every vessel and manned barge less than 24m in length shall carry at least two such lifebuoys, of which at least:

- (a) one buoy shall be provided with a self-igniting light;
- (b) one buoy shall be fitted with a buoyant lifeline.

On vessels and manned barges 24m and above in length, two of the buoys shall be fitted with self-activating smoke signals and be capable of quick release from the navigating bridge. Where applicable, lifebuoys with a light and those with light and smoke signals shall be equally distributed on both sides of the vessel.

(2) Lifebuoys shall be:

- (a) fitted with float-free arrangements, except for lifebuoys fitted with self activating smoke signals;
- (b) marked with retro-reflective material; and
- (c) marked in block capitals of the Roman alphabet with the name and port of registry of the vessel on which it is carried.

(3) A vessel and a manned barge shall carry life jackets, complying with the requirements of 2.2 of the LSA Code, for every person on board.

(4) In addition to the requirement of (3), a vessel and a manned barge shall carry a sufficient number of life jackets as required by the Administration for persons on watch or on duty and for use at remotely-located survival craft stations in unlocked and clearly marked dry stowage conditions. On passenger and cargo-passenger vessels, ten percent of children's life-jackets shall be carried in addition to the number specified in (3).

(5) Lifejackets shall be placed so as to be readily accessible and their positions shall be plainly indicated. Every such lifejacket shall be fitted with retro-reflective material and shall be provided with a whistle firmly secured by a cord.

96. (1) The provisions of (2) and (6) to (10) inclusive apply to new and existing vessels. *Proces*

(2) All persons manning vessels and barges subject to the Regulation shall be trained in launching and operating the survival craft.

(3) Illustrations and instructions relating to the use of life-saving appliances in appropriate languages shall be exhibited at assembly stations and other crew spaces.

(4) Posters or signs shall be provided on or in the vicinity of, survival craft and their launching controls illustrating the launching and boarding procedures for the survival craft.

(5) Assembly stations and embarkation stations shall be adequately illuminated by lighting supplied from the emergency source of electric power.

(6) Each member of the crew shall participate in at least one abandon ship drill and one fire drill every month. On-board training in the use of life-saving appliances, including survival craft equipment, shall be provided at

(7) Each lifeboat, where carried, shall be launched with its assigned operating crew aboard and manoeuvred in the water at least once every three months during an abandon ship drill required by (6)

(8) Rescue boats, other than lifeboats which are also rescue boats, shall be launched with its assigned operating crew aboard and manoeuvred in the water, where reasonable and practicable every month, but in no case less than once every three months.

(9) Emergency instructions, giving instructions to be followed in case of emergency, shall be provided and exhibited in conspicuous places within the vessel, including the navigation bridge, machinery spaces and accommodation spaces. The instructions shall specify details of the general emergency alarm required by regulation 101 and action to be taken by the crew and other persons on board when the alarm is sounded. Instructions on the signal for fire on board and the order to abandon the vessel shall be specified.

(10) The attention of all passengers shall be drawn to the emergency instructions before the vessel departs on the voyage.

(11) On voyages of more than twelve hours' duration the use of life-jackets shall be demonstrated either before the vessel departs on the voyage or immediately thereafter.

(12) Records shall be maintained in the official log book relating to abandon ship drills, fire drills and on-board training.

97. (1) Passenger vessels, cargo-passenger vessels, cargo vessels and manned barges shall, subject to regulation 92(2), carry one or more survival craft complying with the requirements of the LSA Code and of such aggregate capacity as will accommodate the total number of persons on board.
- (2) The arrangement and stowage of such survival craft shall be approved by the Administration having regard to:
- (a) the arrangement and stowage of the survival craft in positions providing for demonstrated easy side-to-side transfer at a single open deck level or the provision of additional survival craft to ensure the effective evacuation of the vessel;
  - (b) the need for carriage of a rescue boat complying with schedule XV or dinghy in place of one or more survival craft; and
  - (c) the alternative arrangements that may be adopted, as set out in Schedule XVII.
- (3) Every oil tanker, chemical tanker and gas carrier shall, in addition to complying with the requirements of (1), carry at least one rigid rescue boat unless:
- (a) all of the required survival craft are lifeboats; or
  - (b) at least one of the required survival craft is a lifeboat complying with the requirements for a rescue boat.
- (4) The equipment to be provided in survival craft shall take into account the sea areas within which the vessel is certificated to trade, distance from the nearest ports of refuge and search and rescue services available in the area and shall comply with schedule XVIII to the extent that the Administration so requires.

(5) Every vessel 24m and above in length shall carry a rescue boat, the capacity of which may be substituted for the capacity of the survival craft required by (1) or (3) as follows:

- (a) if the vessel is certificated to undertake voyages in Unlimited areas of operation, the rescue boat shall comply with the LSA Code;
- (b) if the vessel is certificated to undertake voyages in Inshore or Near-Coastal areas of operation, the rescue boat may comply with schedule XV; and
- (c) if the rescue boat also functions as a work boat its capacity shall not be counted towards the total capacity required on board the vessel by (1) or (3).

98. (1) Survival craft shall be stowed: *Stowage and  
Launching*
- (a) so that neither the survival craft nor its stowage arrangements will interfere with the operation of any other survival craft or rescue boat at any other launching station;
  - (b) as near the water surface as is safe and practicable;
  - (c) so that the life boats and any rescue boats required can easily be launched from the vessel;
  - (d) in a state of continuous readiness so that two crew members can carry out preparations for embarkation and launching in less than 5 minutes; and
  - (e) life rafts intended for throw-overboard launching shall be so stowed as to be readily transferable for launching on either side of the vessel unless life rafts are provided in accordance with regulation 97(2). Arrangements shall be provided to enable a rescue boat to be readily recovered.

(2) Where a life raft is not provided with a launching appliance it shall be stowed with its painter permanently attached to the vessel by a hydrostatic release or other arrangements demonstrated to be no less effective than a hydrostatic release.

(3) Survival craft embarkation arrangements shall be so designed so that, as far as possible, lifeboats and davit-launched life rafts can be boarded and launched from the embarkation deck.

(4) Suitable arrangements shall be made for embarkation into survival craft, which shall include:

- (a) one or more embarkation ladders or other approved means to afford access to the survival craft when it is waterborne;
- (b) means for illuminating the stowage position of survival craft and their launching appliances during preparation for the the process of launching, and also for illuminating the water into which the survival craft are and also for illuminating the water into which the survival craft are launched until the process of launching is completed, the power for which is to be supplied from the emergency source of power required by regulation 60;
- (c) arrangements for warning all persons on board that the ship is about to be abandoned; and
- (d) means for preventing the discharge of water into the survival craft.

(5) Rescue boat embarkation and launching arrangements shall be such that the rescue boat can be boarded and launched in the shortest possible time.

(6) Where the rescue boat is one of the ship's survival craft, the embarkation arrangements and launching station shall comply with the relevant requirements for survival craft of (1)(a) and (5).

- 99 (1) All survival craft shall be marked in capital letters of the Roman alphabet with: *M.*
- (a) the name and port of registry of the vessel
  - (b) the name of approving authority;
  - (c) the number of persons it is permitted to accommodate.
- (2) A label shall be fixed to each survival craft showing the date of the last service and the date by which the next service is required.
100. (1) Before the vessel leaves port and at all times during the voyage, and in the case of barges at all times when the barge is operational and manned, all life-saving appliances on board shall be in working order and ready for immediate use. *Rev. Ma. Inv.*
- (2) Instructions for on-board maintenance of life-saving appliances shall be easily understood and illustrated where possible.
- (3) All survival craft, rescue boats and launching appliances shall be visually inspected weekly to ensure that they are ready for use.
- (4) The general emergency alarm system required by regulation 101 shall be tested weekly.
- (5) Inspection of the life-saving appliances, including lifeboat equipment, shall be carried out monthly using a checklist to ensure that such equipment is complete and in good order. A report of the inspection shall be entered in the official logbook.
- (6) Every inflatable life raft, inflated rescue boat and hydrostatic release unit shall be serviced at intervals of not more than 12 months at an approved servicing station. However, in cases where the service of the vessel and the location of approved service stations makes it impossible to comply with this requirement, the Administration may allow this period to be extended but in no case shall this period be greater than 18 months.
101. (1) Every vessel 24 metres and above shall be provided with a general emergency alarm system for summoning the passengers and crew to assembly stations, operated from the vessel's bridge and powered from the vessel's main and emergency power. The system shall be capable of operation from the navigation bridge or control station as appropriate and shall be audible throughout all accommodation and normal working spaces. *Gen.*
- (2) Passenger and cargo-passenger vessels shall be provided with a public address system to the satisfaction of the Administration.

## PART X RADIOCOMMUNICATIONS

102. (1) Unless expressly provided otherwise, the radiocommunication equipment specified by Chapter IV of SOLAS 74 in relation to the Global Maritime Distress and Safety System (GMDSS) shall be carried by vessels of more than 300 gross tonnage and 24m and above. The provisions of regulation 107 shall apply to all other vessels. *Gen.*



(2) No provision in this Part shall prevent the use by any vessel, survival craft or person in distress, of any means at their disposal to attract attention, make known their position and obtain help.

103. (1) Subject to regulation 107, every vessel of 24m in length and above while at sea shall carry radio equipment capable of complying with the functional requirement identified in 10.2.2 throughout its intended voyage for the sea area or areas through which it will pass during the intended voyage. *Functional Requirement*

- (2) Every vessel, while at sea, shall be capable of:
- (a) transmitting ship-to-shore distress alerts by at least two separate and independent means, each using a different radiocommunication service;
  - (b) receiving shore-to-ship distress alerts;
  - (c) transmitting and receiving ship-to-ship distress alerts;
  - (d) transmitting and receiving search and rescue coordinating communications;
  - (e) transmitting and receiving on-scene communications;
  - (f) transmitting and where applicable receiving signals for locating;
  - (g) transmitting and receiving, subject of regulation 105, maritime safety information at sea and, where appropriate, in port;
  - (h) transmitting and receiving general radiocommunications to and from shore-based radio systems or networks;
  - (i) transmitting and receiving bridge-to-bridge safety communications between ships from the position from which the ships are normally navigated.

104. Every radio installation shall be:

*Vessel Requirement*

- (1) So located that no harmful interference of mechanical, electrical or other origin affects its proper use.
- (2) So located as to ensure the greatest possible degree of safety and operational availability.
- (3) Be protected against harmful effects of adverse environmental conditions.
- (4) Provided with reliable, permanently arranged electrical lighting for adequate illumination..
- (5) Clearly marked with the call sign, the ship station identity and other codes as applicable for the use of the radio installation
- (6) Control of the VHF radiotelephone channels required for navigational safety shall be arranged so that it is readily available on the navigation bridge.

105. (1) Every vessel, while at sea, shall maintain a continuous distress and safety watch on the appropriate distress frequencies identified for the relevant sea area. *Radio Watch*

- (2) Every vessel, while at sea, shall maintain a radio watch for broadcasts of maritime safety information on the appropriate frequency or frequencies on which such information is broadcast for the area in which the vessel is navigating.

(3) Until 1st February 2005 every vessel, while at sea, shall maintain a continuous listening watch on VHF channel 16..

106. (1) The radio equipment required by this Part shall be maintained to ensure effective performance of the requirements of regulation 103(2) and to meet the recommended performance standards for such equipment.
- (2) Adequate information and, as appropriate, instruction shall be provided to enable the equipment to be properly operated and maintained, taking into account the recommendations of the Organization.
107. (1) The radio equipment carried by a new vessel shall be in accordance with the table below and shall be approved by the Administration.

	Sea Area	Proclaimed
Type of Vessel	Near Coastal (Inner and Outer Island) A1 & A2	International Voyages A3
Cargo Vessels	MF/HF DSC	SOLAS
	VHF DSC EPIRB (1)	requirements apply for vessels above 300GT and 24 metres in length
Passenger Vessels > 24 metres	MF/HF DSC VHF DSC SART (1) EPIRB (1) Portable VHF (2)	SOLAS requirements apply for vessels above 300GT and 24 metres in length
Cargo/Passenger Vessel > 24 metres	MF/HF DSC VHF DSC EPIRB (1) Portable VHF (1)	SOLAS requirements apply for vessels above 300GT and 24 metres in length
Fishing vessels > 24 metres	MF/HF DSC VHF DSC EPIRB (1)	To the requirements administration
All vessel < 24 metres	EPIRB (1) Plus other equipments to the requirements of the administration	EPIRB (1) Plus other equipments to the requirements of the administration

Where:

“EPIRB” means an Emergency Position Indicating Radio Beacon as follows:

- (a) for a period of two years following the entry into force of the Regulations, one float-free 121.5MHz EPIRB; and

- (b) after that period, one or more EPIRBs, capable of transmitting a distress alert through the polar orbiting satellite service operating in the 406 MHz band or through the INMARSAT geostationary satellite service operating in the 1.6 GHz band, and complying with the requirements of regulation 111.

“**MF DSC**” means an MF radio installation or installations capable of transmitting and receiving, for distress and safety purposes, on the frequencies 2187.5kHz using DSC and 2182kHz using radiotelephony and of maintaining a continuous DSC watch on the frequency 2187.5kHz.

“**SART**” means a radar transponder capable of operating in the 9GHz band. The radar transponders shall be stowed on the vessel so that they can be rapidly placed in any survival craft.

“**VHF DSC**” means a VHF installation capable of transmitting and receiving:

- (a) DSC on the frequency 156.525MHz (channel 70) and maintaining a continuous DSC watch on VHF channel 70; and
- (b) radiotelephony on frequencies 156.300 MHz (channel 6), 156.650MHz (channel 13) and 156.800 MHz (channel 16).

(2) Existing passenger vessels and cargo-passenger vessels of 24m in length and above shall comply with the requirements of (1) within one-year after the entry into force of the Regulations. Existing cargo vessels of 24m in length and above shall comply with the requirements of (1) within five years after the entry into force of the Regulations.

(3) On all vessels it shall be possible to initiate the transmission of distress alerts on VHF channel 70 from the position from which the vessel is normally navigated. Vessels plying exclusively in sea area A2 need not comply with this requirement if they maintain a continuous listening watch on VHF channel 16 from the navigating bridge.

108. The communications equipment to be carried by cargo vessels less than 24m in length shall be as follows:

*Cargo Vessels  
Less Than*

- (1) An Emergency Position Indicating Radio Beacon as follows:
  - (a) for a period of two years following the entry into force of the Regulations, one float-free 121.5MHz EPIRB; and
  - (b) after that period, one or more EPIRBs, complying with the requirements of regulation 111.
- (2) A radar transponder capable of operating in the 9GHz band. The radar transponder shall be stowed on the vessel so that it can be rapidly placed in any survival craft.
- (3) An emergency means of communication comprising either fixed or portable equipment or both for two-way communications between control stations, assembly and embarkation stations and strategic positions on board.
- (4) The Administration may require additional equipment to be carried so that the ability for the vessel to transmit and receive distress and safety communications is consistent with the GMDSS areas proclaimed depending on the sea areas in which the vessel is trading or fishing or intending to trade or fish.

109. There shall be available at all times, while the vessel is at sea, a supply of electrical energy sufficient to operate the radio installations and to charge any batteries used as part of a reserve sources of energy for the radio installations for a period of 12 hours, as specified in regulation 60(6)(g).
110. (1) A radio log shall be maintained in accordance with the Radio Regulations in a vessel fitted with a GMDSS radiocommunication station. Every qualified operator, master, officer or crew member maintaining a listening watch in accordance with regulation 105 shall enter in the radio log their name and the details of all incidents connected with the radio service which occur during the watch which may appear to be of importance to safety of life at sea. In addition, there shall be entered in the radio logs: *Ro*
- (a) records of distress, urgency or safety traffic received and/or transmitted by INMARSAT and/or NAVTEX systems, maintained as either a print out or stored on computer disks;
  - (b) the full text of distress messages received or transmitted by DSC or radiotelephone;
  - (c) urgency and safety messages received or transmitted by DSC and/or radiotelephone, which may be recorded in summary form;
  - (d) the time listening watch begins when the vessel leaves port and the time at which it ends when the vessel reaches port;
  - (e) the time at which listening watch was discontinued for any reason together with the reason thereof, and the time at which listening watch was resumed thereafter; and
  - (f) details of the maintenance of the batteries, if fitted, including a record of the charging required and carried out.
- (2) Radio logs shall be available for inspection by the officers authorised by the Administration to make such inspection.
111. The EPIRBs referred to in regulation 107 (1) and (2) shall be: *EPI*
- (1) installed in an easily accessible position;
  - (2) ready to be manually released and capable of being carried by one person into a survival craft;
  - (3) capable of floating free if the vessel sinks and of being automatically activated when afloat; and
  - (4) capable of being activated manually.
112. Every vessel shall carry personnel qualified for distress and radiocommunications purposes to the satisfaction of the Administration. *Per*
113. (1) Every vessel which is required by these regulations to carry radio or other communications equipment shall report to such authority as nominated by the Superintendent of Marine. Such vessel shall report at 9.00am 3.00pm each day its position and its traveling record. Such traveling record to include: *Rep*
- (a) destination;
  - (b) time of departure/expected time of departure;
  - (c) time of arrival/expected time of departure;
  - (d) number of passengers.
- (2) Every owner or master who fails to do so commits an offence and shall in addition reimburse the Superintendent of Marine for the cost of any search and rescue operation undertaken as a result of the failure to report.

PART XI  
SAFETY OF NAVIGATION

114. (1) Unless expressly provided otherwise in the Regulations, or unless a vessel or class of vessel is exempted by the Administration, this Part applies to all vessels propelled by mechanical means including those towed or pushed by a tug or other such vessel *General*
- (2) All vessels shall comply with the International Regulations for Preventing collisions at Sea (COLREG), 1972, as amended.
- (3) Wooden vessels of traditional build when propelled by mechanical means shall comply, as far as practicable, with the International Regulations for Preventing Collisions at Sea (COLREG), 1972, as amended.
115. (1) The master of every vessel which meets with dangerous derelict, or any other direct danger to navigation, or a tropical storm or winds of force 10 or above on the Beaufort scale shall communicate such information by all available means to ships in the vicinity and to the competent authorities at the first point on the coast with which the master can communicate. *Danger Me*
- (2) All radio messages issued in accordance with these provisions shall be preceded by the safety signal, using the procedure as prescribed by the Radio Regulations.
- (3) The information to be transmitted shall be as complete as practicable and shall be sent in English.
116. (1) Vessels shall comply with the traffic separation schemes or routing requirements applicable to the area, including avoidance of passage through areas designated as areas to be avoided by ships or certain classes of ships in compliance with the routing measures adopted by the Organization as contained in the latest of the IMO publication *Ships' Routing*. *Routing*
- (2) Wooden vessels of traditional build when propelled by mechanical means shall comply, as far as practicable, with the routing measures adopted by the Organization.
117. The use of an international distress signal, except for the purpose of indicating that a ship, aircraft or person is in distress, and the use of any signal which may be confused with any international distress signal, is prohibited. *Mixture of Sig*
118. (1) The master of a ship at sea on receiving a signal from any source that a ship or aircraft or survival craft thereof is in distress, is bound to proceed with all speed to the assistance of the persons in distress informing them if possible of the action taken. If the master is unable or, in the special circumstances of the case, considers it unreasonable or unnecessary to proceed to their assistance, the reason for failing to proceed to the assistance of the persons in distress must be entered in the official logbook. *Distress Mess*
- (2) The master of such ship shall be released from the obligation imposed by
- (3) If informed by the persons in distress, or by the master of another ship, which has reached such persons, that assistance is no longer necessary.

119. The requirements of regulation V/11 of SOLAS 74 relating to the provision <sup>Sig</sup> of an efficient daylight signalling lamp not solely dependent upon the vessel's main source of electrical power are applicable to vessels 24m and above in length engaged on international voyages. The Administration may extend this requirement to other vessels to which the Regulation apply.
120. (1) Passenger vessels and cargo-passenger vessels of 24m in length and above shall be fitted with a gyrocompass. The gyrocompass or a gyro <sup>Shr</sup> <sup>Eq</sup> repeater shall be clearly readable by the helmsman at the main steering position.
- (2) All vessels shall be fitted with:
- (a) a standard magnetic compass, except as provided in (5);
  - (b) a steering magnetic compass, unless heading information provided by the standard compass required in accordance with (2)(a) is made available and is clearly readable by the helmsman at the main steering position;
  - (c) adequate means of communication between the standard compass position and the normal navigation control position to the satisfaction of the Administration; and
  - (d) means for taking bearings as nearly as practicable over an arc of the horizon of 360°.
- (3) Each magnetic compass referred to in (2) shall be properly adjusted and its table or curve of residual deviations shall be available at all times.
- (4) A spare magnetic compass, interchangeable with the standard compass, shall be carried, unless the steering compass according to (2) (b) or a gyro-compass is fitted.
- (5) The Administration, if it considers it unreasonable or unnecessary to require a standard magnetic compass, may exempt individual vessels or classes of vessels from these requirements if the nature of the voyage, the vessel's proximity to land or the type of vessel does not warrant carriage of a standard compass. If a vessel is so exempted, a suitable steering compass shall be carried with means for taking bearings according to recognized standards.
- (6) Vessels 35m and above in length shall be fitted with a radar installation capable of operating in the 9 GHz frequency band. A vessel may be exempted from compliance with this requirement at the discretion of the Administration, provided that the equipment fitted is fully compatible with the radar transponder for search and rescue specified in regulation 107.
- (7) Vessels shall carry Global Positioning System receivers as follows:
- (a) vessels 24m and above in length certificated to undertake voyages in Near-Coastal areas of operation shall carry a GPS receiver;
  - (b) vessels 24m and above in length certificated to undertake voyages in Unlimited areas of operation shall carry two GPS receivers; and
  - (c) vessels certificated for the carriage of 100 passengers or more shall carry two GPS receivers.
- (8) All equipment fitted in compliance with this regulation shall be of a type approved by the Administration. Equipment installed on board vessels shall conform to appropriate performance standards not inferior to those adopted by the Organization. Equipment fitted prior to the adoption of related

performance standards may be exempted from full compliance with those standards at the discretion of the Administration having due regard to the recommended criteria which the Organization might adopt in connection with the standards concerned.

121. All vessels shall carry adequate, proper, and up-to-date charts, sailing directions, lists of aids to navigation, notices to mariners, tide tables and all other nautical publications necessary for the intended voyage. *Publications*
122. Vessels required to carry radio installations shall carry the International Code of Signals. This publication shall also be carried by any other vessel, which, in the opinion of the Administration, has a need to use it. *International Code of Signals*
123. Life-saving signals shall be used by vessels when communicating with ships or persons in distress or when communicating with life-saving stations, maritime rescue units and aircraft engaged in search and rescue operations. An illustrated table describing the life-saving signals shall be readily available to the officer of the watch of every vessel. *Life-saving signals*
124. (1) Ships of 24m and above in length, engaged on voyages in the course of which a pilot is likely to be employed, shall be provided with appropriate pilot transfer arrangements. *Pilot transfer arrangements*  
(2) All arrangements used for pilot transfer shall efficiently fulfill their purpose of enabling pilots to embark and disembark safely. The appliances shall be kept clean, properly maintained and stowed and shall be regularly inspected to ensure that they are safe to use. They shall be used solely for the embarkation and disembarkation of personnel.  
(3) The rigging of the pilot transfer arrangements and the embarkation of a pilot shall be supervised by a responsible officer having means of communication with the navigation bridge, who shall also arrange for the escort of the pilot by a safe route to and from the navigation bridge. Personnel engaged in rigging and operating any mechanical equipment shall be instructed in the safe procedures to be adopted and the equipment shall be tested prior to use.  
(4) Arrangement shall be provided to enable the pilot to embark and disembark safely on either side of the ship.

## PART XII ASSIGNMENT OF LOADLINES

125. (1) Vessels and barges shall not proceed to sea unless surveyed, marked and certified in accordance with the provisions of the Regulations. *General*  
(2) Nothing in the Regulations shall prevent the Administration from assigning a greater freeboard than the minimum freeboard determined in accordance with regulation 128.
126. The appropriate freeboard marks on the sides of the vessel shall not be submerged at any time when the vessel puts to sea, during the voyage or on arrival. *Submersion Of Freeboard Marks*
127. The deck line is a horizontal line 250mm in length and 25mm in breadth. It shall be marked amidships on each side of the vessel, and its upper edge shall normally pass through the point where the continuation outwards of the upper surface of the freeboard deck intersects the outer surface of the shell, *Deckline*

provide that the deck line may be placed with reference to another fixed point on the vessel on condition that the freeboard is correspondingly corrected. The location of the reference point and the identification of the freeboard deck shall in all cases be indicated on the Record of Equipment and Ship Information.

128. (1) The freeboard mark shall consist of a ring 250mm in outside diameter and 25mm wide which is intersected by a horizontal line 375mm in length and 25mm in breadth, the upper edge of which passes through the centre of the ring. The centre of the ring shall be placed amidships and at a distance equal to the assigned freeboard measured vertically below the upper edge of the deck line. If there is not sufficient space for placing a full freeboard mark, the mark may be cut off after marking the upper half circle as far as possible.

(2) The assigned freeboard shall not be less than that determined by the following table, where freeboards at intermediate lengths are obtained by linear interpolation:

Length of vessel	16m	18m	21m	24m
Freeboard	150mm	162mm	181mm	200mm

(3) The freeboard calculated in accordance with (2) shall be increased by 50mm, if the hatchways are not secured watertight by steel covers or equivalent means.

129. (1) The minimum bow height, defined as the vertical distance at the forward perpendicular between the waterline corresponding to the assigned freeboard at the designed trim and the top of the exposed deck at side, shall not be less than that obtained from the formula:

$$56L\left(1 - \frac{L}{500}\right) \text{ (mm)}$$

(2) Notwithstanding the requirement of (1), the minimum vertical distance at the forward perpendicular between the waterline corresponding to the assigned freeboard at the designed trim and the top of the bulwark rail or visor shall not be less than 0,1L and shall extend from the stem to a point at least 0,1L aft of the forward perpendicular.

(3) The minimum stern height, defined as the vertical distance at the after perpendicular between the waterline corresponding to the assigned freeboard at the designed trim and the top of the exposed deck at side, shall not be less than half the minimum bow height.

(4) The minimum bow height of vessels certificated to undertake voyages in Inshore areas of operation and operating solely on harbour and roadstead service may be reduced to no less than 500mm and the minimum stern height at the designed trim may be reduced to no less than the assigned freeboard at amidships



130. The mark of the Administration by which the load lines and freeboard are assigned may be indicated alongside the ring above the horizontal line, which passes through the centre of the ring, or above and below it. This mark shall consist of the letters "SIG", each measuring approximately 100mm in height and of proportionate breadth. *Marks of Authority*
131. The ring, lines and letters shall be painted in white or yellow on a dark ground or in black on a light ground. They shall also be permanently marked on the sides of the vessel. The marks shall be plainly visible. *Details*
132. The Solomon Islands Safety Certificate shall not be issued to the vessel until the officer or surveyor acting under the provisions of Part II has certified that the marks are correctly and permanently indicated on the vessel's sides. *Verification*
133. (1) All openings and penetrations in watertight or weathertight structures shall be fitted with efficient means of closure that are of equivalent strength to the structure in which they are located and such that they will maintain its watertight or weathertight integrity. *Openings and Penetrations*
- (2) Through-hull penetrations shall be kept to a minimum consistent with the operational needs of the vessel and, where fitted, means shall be provided for positively shutting off such penetrations.
- (3) Pipe connections that penetrate the hull shall be fitted with watertight valves or cocks that are readily accessible and easily operable in an emergency. These fittings shall be connected direct to the hull or to a box that is efficiently attached to the hull.
- (4) Inlet and discharge pipes from a water closet shall be provided with ship side fittings in accordance with (2). When the rim of a toilet bowl is less than 300mm above the assigned waterline of the ship, anti-siphon measures shall be provided.
- (5) Engine exhaust outlets that penetrate the hull below the deck shall be provided with an effective means to prevent backflooding into the hull through the exhaust system.
- (6) All pipes that carry seawater shall be of marine quality, except that:
- (a) in any vessel less than 24m in length, the hull of which is constructed of non-metallic materials, non-metallic piping may be fitted; and
  - (b) suitable reinforced synthetic rubber piping may be used in short lengths for the purpose of vibration damping.
- (7) Where non-metallic piping or reinforced synthetic rubber piping is fitted, it shall:
- (a) have a high resistance to salt water, fuel oil, heat and vibration;
  - (b) be capable of operating under suction without collapse;

- (c) non-metallic piping shall have appropriate resistance to impact damage; and M.  
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- (d) reinforced synthetic rubber piping shall be readily visible and protected against mechanical damage and contact with hot surfaces

(8) Access openings in a weathertight superstructure, deckhouse or deck shall be fitted with weathertight doors or hatches that open outward and that are generally hinged on the forward or outboard sides. De

(9) Windows, portlights and skylights shall be fitted with shatter proof safety glass of adequate strength in compliance with Schedule XIX. On existing vessels the glass fitted may be accepted by the Administration where its condition and installation are satisfactory. Fixtures through which downflooding into the hull can occur shall be provided with weathertight covers, which shall be permanently attached. Where this is not practicable they shall be provided with means of securing that can be fitted quickly in adverse weather conditions. Ver  
Op  
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(10) Air pipes and ventilators through which downflooding into the hull can occur shall be fitted with permanently attached weathertight means of closure.

(11) Pipes that penetrate watertight bulkheads shall have watertight valves of adequate construction located on the bulkhead. Such valves shall be remotely-controlled from above the main deck or shall be fitted on each side of the bulkhead and be readily accessible in an emergency situation.

(12) Electric cables, steering cables or similar systems that penetrate watertight or weathertight structures shall be fitted with equivalent watertight or weathertight glands and, where located below the watertight deck, shall be as high as possible above the waterline.

134. (1) Exterior openings through which downflooding into the hull can occur shall be fitted with coamings of equivalent strength to the structure in which they are located.

(2) The coamings shall be constructed as high as is practicable and their height shall not be less than the following:

	Vessel certificated to undertake voyages in areas of operation:		
	Unlimited	Near-Coastal	Inshore
Door sills and companion ways on the main deck	380mm	230mm	230mm
Hatches	450mm	380mm	300mm
Ventilators	760mm	500mm	300mm
Air pipes	600mm on freeboard deck and 300mm on superstructure deck	600mm freeboard deck and 300mm on superstructure deck	300mm or as approved by the Administration

(3) No side scuttle shall be fitted in such a position that its lower edge is below a line drawn parallel to the freeboard deck at side and having its lowest point at a distance 500mm for vessels certificated to undertake voyages in Unlimited and Near-Coastal areas of operation and 150mm for vessels certificated to undertake voyages in Inshore areas of operation.

(4) The minimum area of freeing ports on any deck fitted with bulwarks shall be no less than 10 per cent of the area of each continuous portion of the bulwark.

135. (1) Hatchway covers shall be of a strength and stiffness in accordance with Schedule XX. *Hatchway*

(2) The means of securing and maintaining weathertightness shall be demonstrated to be satisfactory. The arrangements shall be such as to ensure that the watertightness can be maintained in any sea conditions, and for this purpose tests for watertightness shall be required at the initial survey and may be required at intermediate and annual surveys or at more frequent intervals.

136. (1) Machinery casings shall be protected by an enclosed poop or bridge of at least standard height, or by a deckhouse of equal height and equivalent strength, provided that machinery casings may be exposed if there are no openings giving direct access from the freeboard deck to the machinery space. A weathertight door may, however, be permitted in the machinery casing, provided that it leads to a space separated from the stairway to the engine room by a second weathertight door of steel or other equivalent material. *Tankers*

(2) An efficiently constructed fore and aft permanent gangway of sufficient strength shall be fitted on tankers at the level of the superstructure deck between the poop and the midship bridge or deckhouse where fitted, or equivalent means of access shall be provided to carry out the purpose of the gangway, such as passages below deck. Elsewhere, and on tankers without a midship bridge, arrangements to the satisfaction of the Administration shall be provided to safeguard the crew in reaching all parts of the vessel used in the necessary work of the vessel.

(3) Safe and satisfactory access from the gangway level shall be available between separate crew accommodations and also between crew accommodation and the machinery space.

(4) Exposed hatchways on the freeboard and forecastle decks or on the tops of expansion trunks on tankers shall be provided with efficient watertight covers of steel or other equivalent material.

(5) Tankers with bulwarks shall have open rails fitted for at least half the length of the exposed parts of the weather deck or other effective freeing arrangements. The upper edge of the sheer strake shall be kept as low as practicable.

(6) Where superstructures are connected by trunks, open rails shall be fitted for the whole length of the exposed parts of the freeboard deck.

(7) Tankers less than 24m in length shall comply in general with the applicable provisions of this regulation. For such vessels, the Administration may waive the requirements of this regulation which it considers to be impracticable in relation to the size and service characteristics of the vessel, the sea areas within which it is certificated to trade and the prevailing weather conditions.

### PART XIII ACCOMMODATION AND GENERAL PROTECTION MEASURES AGAINST ACCIDENTS

137. (1) Passenger and crew accommodation shall be adequate for the intended service of the vessel. A

(2) All accommodation shall be kept in a habitable and sanitary condition.

138. (1) Hinged covers of hatchways manholes and other similar opening shall be protected against accidental closing. In particular, heavy covers on escape hatches shall be equipped with counter weights. Escape doors and covers of escape and access hatches shall be so constructed as to be capable of being opened from either side of the door or cover. A P

(2) Access hatches shall have dimensions such as to allow quick and easy escape to a safe place in the event of an emergency. Where practicable, the dimensions of access hatches of cargo and machinery spaces shall be such that they will facilitate expeditious rescue operations.

(3) Handrails, grabrails and handholds of sufficient size and strength shall be provided as support for persons when the vessel is severely rolling or pitching.

(4) Skylights of machinery spaces or other similar openings, which are normally kept open at sea, shall be provided with adequately spaced protective bars or other arrangements to prevent a person from falling into the space accidentally. Where the size of such an opening is small, the Administration may waive this requirement if satisfied that, due to the small size of the opening, no protective arrangement is necessary.

(5) Surfaces of all decks shall be so prepared or treated as to minimize the possibility of persons slipping. In particular, decks and platforms in machinery spaces, floors of galleys, decks at winch positions and areas at the head and foot of ladders, steps of ladders and in front of doors shall be provided with anti-slip surfaces.

(6) Machinery, fuel tanks and associated piping shall be of a design and construction adequate for the service for which they are intended and shall be installed and protected so as to minimize the danger to persons during normal movement about the vessel, due regard being paid to moving parts, hot surfaces and other hazards.

(7) Machinery spaces shall be designed so as to provide safe and free access to all machinery and machinery controls, including any components that may require servicing at sea and while the vessel is in operation. Such spaces shall be adequately ventilated.

(8) Moving parts of machinery shall be properly guarded.

(9) Efficient guard rails or bulwarks shall be fitted on all exposed parts of the freeboard and superstructure decks. The height of the bulwarks or guard rails shall be at least 1m above the deck, provided that where this height would interfere with the normal operation of the vessel, a lesser height may be approved if the Administration is satisfied that adequate protection is provided but shall not be less than 600mm.

(10) The opening below the lowest course of the guard rails shall not exceed 230mm. The other courses shall be not more than 380mm apart. In the case of vessels with rounded gunwales the guard rail supports shall be placed on the flat of the deck.

(11) Satisfactory means, in the form of guard rails, life lines, gangways or underdeck passages, etc. shall be provided for the protection of the crew in getting to and from their quarters, the machinery space and all other parts used in the necessary work of the vessel.

(12) In addition to complying with the provisions of Part XIII every vessel shall comply with any other requirements which, in the opinion of the Administration, are necessary to prevent accidents at sea and to maintain appropriate living and working conditions. Such requirements as may be determined by the Administration shall be consistent with the ILO Code of Practice *Accident prevention on board ship at sea and in port* to the extent reasonable and practicable.

139. (1) In vessels carrying vehicles, effective barriers, chains or cables shall be installed at the open ends of any vehicle deck. *Cargo*

(2) Deck cargo carried on any vessel shall be so stowed that any opening which is in way of the cargo and which gives access to and from the crew's quarters, the machinery space and all other parts of the vessel used in the necessary work of the vessel, can be properly closed and secured against the admission of water. Effective protection for the crew in the form of guard rails or life lines shall be provided above the deck cargo if there is no convenient passage on or below the deck of the vessel.

SCHEDULE I  
SOLOMON ISLANDS VESSEL SAFETY CERTIFICATE  
(REGULATION 27(1))  
Safety Regulations for Non-Convention Vessels Operating in Solomon Islands

**SOLOMON ISLANDS VESSEL SAFETY CERTIFICATE**

Issued under the provisions of the Safety Regulations for Non-Convention Vessels  
under the authority of the Government of Solomon Islands

*BY MARINE DIVISION*

Name of VESSEL	Official No. and call sign	Port of registry	Gross tonnage or Length (m)	Date of build	IMO No.

Valid for: unrestricted voyages in the Pacific Islands area<sup>1</sup>  
restricted to Near-Coastal voyages  
restricted to Inshore voyages

Vessel type<sup>1</sup>  
Passenger                      Tanker  
Cargo-passenger          Gas carrier  
Cargo                         Other (specify)

Total maximum number of persons that the vessel is authorized to carry, being: \_\_\_\_\_ crew  
\_\_\_\_\_ passengers

**THIS IS TO CERTIFY:**

1. That the vessel has been surveyed in accordance with the applicable provisions of the Safety Regulations for Non-Convention Vessels operating in Solomon Islands and has been found to comply with the requirements of those provisions.
2. That the survey showed that a freeboard of \_\_\_\_\_ mm was assigned and marked on the ship's side at amidships.]
3. The last two inspections on the outside of the ship's bottom took place on the \_\_\_\_\_ and \_\_\_\_\_ (dates).
4. That an Exemption Certificate has/has not<sup>1</sup> been issued.

This certificate is valid until \_\_\_\_\_<sup>2</sup> subject to the annual and periodical surveys and inspections of the outside of the ship's bottom in accordance with Part II of the Regulations.

Issued at \_\_\_\_\_  
(Place of issue of certificate)

\_\_\_\_\_  
(Date of Issue)

\_\_\_\_\_  
(Signature of authorized official issuing the certificate)

(Seal or stamp of the issuing authority, as appropriate).

<sup>1</sup> Delete as appropriate.

<sup>2</sup> Insert the date of expiry as specified by the Administration in accordance with Regulation 29. The day and the month of this date correspond to the anniversary date as defined in Regulation 3, unless amended in accordance with Regulation 29.

*Endorsement for annual and intermediate surveys relating to structure, machinery and equipment*

THIS IS TO CERTIFY that, at a survey required by the Regulations, the ship was found to comply with the relevant requirements of the Regulations.

Annual Survey: Signed: .....  
 (Signature of authorized official)  
 Place: .....  
 Date: .....  
 (Seal or stamp of the authority, as appropriate)

Annual/Intermediate survey: Signed: .....  
 (Signature of authorized official)  
 Place: .....  
 Date: .....  
 (Seal or stamp of the authority, as appropriate)

Annual/Intermediate survey: Signed: .....  
 (Signature of authorized official)  
 Place: .....  
 Date: .....  
 (Seal or stamp of the authority, as appropriate)

Annual survey: Signed: .....  
 (Signature of authorized official)  
 Place: .....  
 Date: .....  
 (Seal or stamp of the authority, as appropriate)

*Endorsement for inspections of the outside of the ship's bottom*

THIS IS TO CERTIFY that, at an inspection required by the Regulations, the ship was found to comply with the relevant requirements of the Regulations.

First inspection: Signed: .....  
 (Signature of authorized official)  
 Place: .....  
 Date: .....  
 (Seal or stamp of the authority, as appropriate)

Second inspection: Signed: .....  
 (Signature of authorized official)  
 Place: .....  
 Date: .....  
 (Seal or stamp of the authority, as appropriate)

## Endorsement for annual and intermediate surveys relating to life-saving and other equipment

THIS IS TO CERTIFY that, at a survey required by Part II of the Regulations, the ship was found to comply with the relevant requirements of the Regulations.

Annual survey: Signed: .....  
 (Signature of authorized official)  
 Place: .....  
 Date: .....  
 (Seal or stamp of the authority, as appropriate)

Annual/Intermediate survey: Signed: .....  
 (Signature of authorized official)  
 Place: .....  
 Date: .....  
 (Seal or stamp of the authority, as appropriate)

Annual/Intermediate survey: Signed: .....  
 (Signature of authorized official)  
 Place: .....  
 Date: .....  
 (Seal or stamp of the authority, as appropriate)

Annual survey: Signed: .....  
 (Signature of authorized official)  
 Place: .....  
 Date: .....

## Endorsement for surveys relating to radio installations

THIS IS TO CERTIFY that, at a survey required by Part II of the Regulations, the ship was found to comply with the relevant requirements of the Regulations.

Intermediate survey: Signed: .....  
 (Signature of authorized official)  
 Place: .....  
 Date: .....  
 (Seal or stamp of the authority, as appropriate)

Intermediate survey: Signed: .....  
 (Signature of authorized official)  
 Place: .....  
 Date: .....  
 (Seal or stamp of the authority, as appropriate)

Intermediate survey: Signed: .....  
 (Signature of authorized official)  
 Place: .....  
 Date: .....  
 (Seal or stamp of the authority, as appropriate)

Intermediate survey: Signed: .....  
 (Signature of authorized official)  
 Place: .....  
 Date: .....  
 (Seal or stamp of the authority, as appropriate)

Delete as appropriate



Endorsement where the renewal survey has been completed and regulation 29(5) of the Regulations, applies

The ship complies with the relevant requirements of the Regulations, and this certificate shall, in accordance with regulation 29(5) of the Regulations, be accepted as valid until .....

Signed: .....

(Signature of authorized official)

Place: .....

Date: .....

(Seal or stamp of the authority, as appropriate)

Endorsement to extend the validity of the certificate until reaching the port of survey or for a period of grace where 29(6) of the Regulations applies

This certificate shall, in accordance with regulation 29(6) of the Regulations, be accepted as valid until .....

Signed: .....

(Signature of authorized official)

Place: .....

Date: .....

(Seal or stamp of the authority, as appropriate)

Endorsement for advancement of anniversary date where 29(7) of the Regulations applies

In accordance with 29(7) of the Regulations, the new anniversary date is .....

Signed: .....

(Signature of authorized official)

Place: .....

Date: .....

(Seal or stamp of the authority, as appropriate)

In accordance with 29(7) of the Regulations, the new anniversary date is .....

Signed: .....

(Signature of authorized official)

Place: .....

Date: .....

(Seal or stamp of the authority, as appropriate)

**SCHEDULE III**  
**FORM OF RECORD OF EQUIPMENT AND SHIP INFORMATION**  
**(REGULATION 27(2))**

**Safety Regulations for Non-Convention Vessels Operating in Solomon Islands**

**Record of Equipment and Ship Information**

*This record shall be available on board vessels issued with a Solomon Islands Vessel Safety Certificate*

Name of Vessel	Official No.	Port of registry	Gross tonnage

**1.1 VESSEL PARTICULARS**

Call sign	IMO No.	Date of build	Type of ship

Where built	
Construction material	
Type & No. of engines	
No. of propellers	Service speed

**1.2.1 CERTIFICATION - International certificates issued (if appropriate)**

Certificate	Required <sup>3</sup>	Date of issue	Date of expiry	Issuing authority
Tonnage				
Safety Radio				
Load Line				
IOPP				
Other (Specify) <sup>1</sup>				

**1.2.2 CERTIFICATION - Other**

Certificate	Date of issue	Date of expiry	Issuing authority
Safe Manning Certificate <sup>4</sup>			
Certificate of Registry			

1.3	Classification society	
1.4	Number of persons for which life-saving appliances are provided	
1.5	Number of crew for which accommodation is provided	
1.6	Engine room classification (unmanned (UMS) / periodically unmanned)	

.....  
 (Date of issue)

.....  
 (Signature of authorized official)

(Seal or stamp of issuing authority, as appropriate)

<sup>3</sup> Where the ship is required to hold any of the specified international certificates enter "Yes" in this column, followed by appropriate entries in the subsequent columns otherwise enter "No" and "NA" respectively

<sup>4</sup> IMO resolution A.48 (XII)

## 1. GENERAL

GENERAL ARRANGEMENT - SKETCHES AND PLANS - (Part III<sup>5</sup>)Indicate on the outline sketches below<sup>6</sup>:-

- General arrangement of superstructures
- Number of decks
- Position of engine room
- Position of holds and hatches
- Position of tanks (indicate use)
- Transverse watertight bulkheads

Profile
Weather Deck
Tank Top Deck

Average daily consumption at full service speed:-

Total Bunker capacity \_\_\_\_\_

Total FW capacity \_\_\_\_\_

Total Ballast capacity \_\_\_\_\_

<sup>5</sup>Part numbers refer to the Regulations.<sup>6</sup>Alternatively, a General Arrangement plan may be attached.

## 2. CONSTRUCTION

## 2.1 STABILITY AND LOAD LINES - (Part IV and Part XII)

## 2.1.1 STABILITY DETAILS

INCLINING TEST or ROLL TEST	Date of test	Place of test	Administration/
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STABILITY CRITERIA MET*	Regulations Schedule VI	4.5 of Intact Stability Code (Offshore supply vessels)	Other criteri
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\* Indicate as appropriate

APPROVED STABILITY INFORMATION	Date approved	Approving authority	Information on Yes/No
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## 2.1.2 Statement of flag State stability requirements

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## 2.1.3 LOAD LINES - (Part XII)

Freeboard of .....m has been assigned under International convention on load lines, 1966/Safety regulations for Non-Convention Vessels Operating in the Pacific Region\* in relation to the deckline (reference point - Regulation 12.3 .....m above the baseline at a distance of .....m forward/aft\* of amidships). The freeboard deck is identified as Deck .....

\*Delete whichever is inapplicable.

## 2.2 MACHINERY - (Part VI)

## 2.2.1 MAIN ENGINE DETAILS

Make (No.)		Type	
No. of cylinders		R.P.M	
Power (kW)		Starting system	
Unmanned machinery space (U.M.S)			
Arrangements (If any)			

## 2.2.2 AUXILIARY MACHINERY - (Part V)

	No.	Make	Output (kW)
MAIN GENERATORS			
EMERGENCY GENERATOR			
OTHER (SPECIFY)			

## 2.2.3 BOILERS AND PRESSURE VESSELS - (Part V)

ITEM	Description	Working pressure	Date of last test

## 2.3 MAIN AND EMERGENCY STEERING GEAR - (Part V)

## 2.3.1 RUDDERS

Type	Number fitted	Remarks

## 2.3.2 DESCRIPTION OF STEERING GEAR ARRANGEMENTS - (Part V)

BRIDGE TO STEERING COMPARTMENT/RUDDER Bridge to steering compartment/rudder arrangements include mechanical (e. and chain), hand hydraulic, and electric systems. The description should contain sufficient detail to give a clear picture of the system.)

Manufacturer:

Type:

Description:

MAIN STEERING GEAR (Main steering gear arrangements include mechanical (e.g. rod and chain), hydraulic, and electric hydraulic. Again, sufficient detail should be provided in the description to give a clear picture of the system.)

Manufacturer:

Type:

Description:

## 2.3.3 EMERGENCY STEERING - (Part v)

Complete description of emergency/alternative steering arrangements:-

Details of communication between bridge and emergency/alternative steering position:-

Details of provision of compass at emergency/alternative steering position

## 2.4 ANCHORING ARRANGEMENTS - (Part III)

## 2.4.1 ANCHORS

NO.	TYPE	SIZE	LOCATION
1			
2			
3			
4			

## 2.4.2 ANCHOR CABLES

NO.	TYPE	SIZE	LENGTH
1			
2			
3			
4			

## 2.4.3 MEANS OF HOISTING

NO.	TYPE	POWER	LOCATION
1			
2			
3			
4			

## 3.0 FIRE PROTECTION FIRE DETECTION AND FIRE EXTINCTION

## 3.1 STRUCTURAL FIRE PROTECTION - (Part VIII)

SUMMARY OF ADMINISTRATION REQUIREMENTS

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## 3.2. FIRE APPLIANCES - (Part VII)

## 3.2.1 MAIN FIRE PUMP(S)

NO.	TYPE	CAPACITY	PRESSURE HEIGHT	WHERE PLACED
1				
2				
3				
4				

## 3.2.2 EMERGENCY FIRE PUMP(S) - (Part VII)

NO.	TYPE	CAPACITY	PRESSURE HEIGHT	WHERE PLACED
1				
2				
3				
4				

## 3.2.3 FIRE MAIN AND HYDRANTS - (Parts VII)

NO.	DIAMETER	PRESSURE	WHERE PLACED
	FIRE MAIN		
	FIRE HYDRANT		

## 3.2.4 HOSES AND NOZZLES AND INTERNATIONAL SHORE CONNECTION - (Part VII)

NO	DESCRIPTION	
	INTERNATIONAL SHORE CONNECTION DETAILS	LOCATION:
	HOSE LENGTH WITH COUPLINGS	MACHINERY SPACES
		OTHER SPACES
	PLAIN NOZZLES	OUTSIDE MACHINERY SPACE
	DUAL PURPOSE NOZZLES	MACHINERY SPACES
		OTHER SPACES
		DIAMETER OF NOZZLE OUTLET
		EQUIVALENT DIAMETER OF NOZZLE
		EQUIPMENT DIAMETER OF NOZZLE

## 3.2.5 FIRE EXTINGUISHERS - (Part VII)

LOCATION	TYPE	NUMBER	SIZE	SPARE CHARGES
MACHINERY SPACES				
CREW SPACES				
OTHER SPACES				

## 3.2.6 FIRE BUCKETS - (Part VII)

LOCATION	NUMBER	DESCRIPTION

## 3.2.7 FIREMAN'S OUTFIT - (Part VII)

	NO.	TYPE	MAKE	LOCATION
PROTECTIVE CLOTHING				
BOOTS				
GLOVES				
HELMET				
SAFETY LAMP				
HAND AXE				
BREATHING APPARATUS				
FIREPROOF LIFE LINE				

## 3.2.8 FIRE AXES - (Part VII)

NUMBER	LOCATION

## 3.2.9 FIRE CONTROL PLAN - (Part VII)

LOCATION	REMARKS

## 3.3 FIXED FIRE EXTINGUISHING SYSTEMS - (Part VII)

## 3.3.1 MACHINERY SPACES

LOCATION	TYPE	NAME	DATE OF SURVEY

## 3.3.2 CARGO HOLDS

LOCATION	TYPE	NAME	DATE OF SURVEY



## 3.4 DETECTION AND ALARM SYSTEMS - (Part VII)

DETECTORS	MACHINERY SPACE		
	CARGO SPACE		
	ACCOMMODATION AND SERVICE SPACE		
MANUAL CALL POINTS	MACHINERY SPACE		
	CARGO SPACE		
	ACCOMMODATION		
CONTROL AND INDICATING LIGHTS	LOCATION	NO	DESCRIPTION

## 4. LIFE-SAVING APPLIANCES AND EQUIPMENT

## 4.1 LIFEBOATS - (Part IX)

No of boats	Description	Measurements			Cubic Capacity	No. Of persons	Internal buoyancy		Weight fully Laden
		Length	Breadth	Depth			Material	Cubic capacity	

## 4.2 RESCUE BOAT - (Part IX)

MAKER'S NAME	LENGTH	NO. OF PERSONS	WEIGHT COMPLETE	STOWAGE
TYPE OF ENGINE				

## 4.3 LIFERAFTS - (Part IX)

INFLATABLE LIFERAFT	MANUFACTURER AND TYPE	NO. OF PERSONS	NUMBER	STOWAGE
RIGID LIFERAFT				
HYDROSTATIC RELEASE UNIT				

## 4.4 LIFEBOAT DAVITS - (Part IX)

DAVITS OR LAUNCH/RECOVERY	DESCRIPTION	S.W.L./SFT

DEVICE	
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## 4.5 LIFEBOAT WINCHES \*(Part IX)

WINCHES	DESCRIPTION	S.W.L.
FALLS	TYPE OF PURCHASE ROPE OR WIRE CONSTRUCTION      SIZE BREAKING STRAIN:	

## 4.6 SURVIVAL CRAFT LAUNCHING AND RECOVERY - (Part IX)

DESCRIPTION:
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## 4.7 LIFE JACKETS -(Part IX)

	MANUFACTURER	TYPE	NUMBER		STOWAGE
			32kg or more (adult)		
			under 32kg (child)		

## 4.8 LIFEBOUYS - (Part IX)

	TYPE	NUMBER WITH SMOKE	NUMBER WITH LINES	NUMBER WITH LIGHTS
LIFEBUOY				
	STOWAGE			

## 4.9 PYROTECHNICS - (Part IX)

DISTRESS SIGNALS		MANUFACTURERS NAME AND DESCRIPTION
	PARACHUTE	
	RED STAR	
LIFEBOAT DISTRESS SIGNALS	PARACHUTE	
	HAND FLAGS	
	BUOYANT SMOKE	

## 4.10 EMERGENCY LIGHTING - (Part VI)

SOURCE OF POWER INCLUDING RATING CAPACITY	
IF GENERATOR, MEANS OF STARTING	
SERVICES SUPPLIED	

## 4.11 RADIO EQUIPMENT - (Part X)

	NUMBER	TYPE	SERIAL NO:
SURVIVAL CRAFT PORTABLE RADIO			

## 4.12 PORTABLE VHF RADIOS - (Part X)

	NUMBER:	TYPE	SERIAL NO:
PORTABLE TWO WAY V.H.F. RADIOS			

## 5. RADIOCOMMUNICATIONS - PART X

Note: The radio equipment required to be fitted will depend on the requirements of the Administration in the context of the GMDSS AREA PROCLAIMED IN RESPECT OF THE SEA AREAS IN WHICH THE VESSEL IS CERTIFICATED TO UNDERTAKE VOYAGES

## 5.1 RADIO OPERATORS - (Part X)

REQUIRED NO. OF PERSONS QUALIFIED TO OPERATE THE RADIO INSTALLATION
---

## 5.2 V.H.F RADIO INSTALLATION - (Part X)

	MAKE	TYPE	NO	DESCRIPTION
RADIOTELEPHONE				
RADIOTELEPHONE				
D.S.C. ENCODER				
D.S.C. WATCH RECEIVER				

## 5.3 MF RADIO INSTALLATION - (Part X)

	MAKE	TYPE	NO	DESCRIPTION
RADIO TELEPHONE*				
DSC ENCODER				
DSC WATCH RECEIVER				

## 5.4 MF/HF RADIO INSTALLATION - (Part X)

	MAKE	TYPE	NO	DESCRIPTION
RADIO TELEPHONE*				
DSC ENCODER				
DIRECT PRINTING TELEGRAPHY				

## 5.5 INMARSAT EQUIPMENT - (Part X)

TYPE	SERIAL NO:

## 5.6 SECONDARY MEANS OF ALERTING - (Part X)

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## 5.7 FACILITIES FOR RECEPTION OF MARITIME SAFETY INFORMATION - (Part X)

	MAKE	TYPE	NO	DESCRIPTION
NAVITEX RECEIVER				
E.G.C. RECEIVER				
HF DIRECTION PRINTING RADIOTELEGRAPH RECEIVER				

## 5.8 EPIRBS - (Part X)

NUMBER	TYPE	SERIAL NUMBER(S)

## 5.9 SART - (Part X)

	MANUFACTURER:	SERIAL NO:

## 5.10 2182 kHz -ALARM SIGNAL GENERATOR (where required) - (Part X)

MANUFACTURER	SERIAL NO

## 5.11 SOURCES OF ENERGY - (Part X)

MAIN SOURCE	
RESERVE SOURCE	

## 5.12 AUTO ALARM ARRANGEMENTS - (Part X)

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## 5.13 MISCELLANEOUS - (Part X)

INSTRUCTIONS ON HOW TO OPERATE EQUIPMENT	
CLOCK AND CALL SIGN DISPLAYED	
RADIO LOG	

## 6. NAVIGATION LIGHTS AND SOUND SIGNALLING EQUIPMENT

## 6.1 GENERAL ARRANGEMENT OF NAVIGATION LIGHTS - (Part XI)

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## 6.2 NAVIGATION LIGHTS - (Part XI)

PRIMARY				ALTERNATIVE		
LANTERN	MAKER	TYPE AND SERIAL NO.	LAMP /BURNER	MAKER	TYPE AND SERIAL NO.	LAMP WATTA GECD BURNER
MAST HEAD						
MAST FORE						
PORT						
S/BOARD						
STERN						
ANCHOR						
NOT UNDER COMMAND						

## 6.3 NAVIGATION LIGHT POWER SUPPLY - (Part V)

MAIN POWER SUPPLY	
ALTERNATIVE POWER SUPPLY	

## 6.4 SOUND SIGNALS, SHAPES AND ADDITIONAL LANTERNS - (Part XI)

DIAMETER AND POSITION OF BELL	TYPE OF WHISTLES(S)	NUMBER OF NUC SHAPES	ANCHOR BALL	BLACK DIAMOND	ADDITIONAL LANTERNS SHAPES

## 6.5 INTERNATIONAL CODE FLAGS - 0

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## 7. SAFETY OF NAVIGATION - PART XI

## 7.1 COMPASSES - (Part VI)

	MAKE	TYPE	REMARKS
COMPASSES			

## 7.2 ELECTRONIC NAVIGATION EQUIPMENT - (Part XI)

	MANUFACTURER AND TYPE	SERIAL NO.	REMARKS
RADAR			
SATELLITE NAVIGATION			
RADIO DIRECTION FINDER			
ECHO SOUNDER			
SPEED LOG			
G.P.S.			

## 7.3 BRIDGE CONTROLS AND INSTRUMENTS - (Part V)

TYPE:	DESCRIPTION

## 7.4 SIGNALLING LAMP - (Part XI)

SIGNALLING LAMP	MAKER'S NAME AND/OR NUMBER	NUMBER PROVIDED
-----------------	----------------------------	-----------------

## 7.5 PUBLICATIONS - (Part XI)

NO.	REMARKS/DESCRIPTION
CHARTS	
SAILING DIRECTIONS	
TIDE TABLES	
INTERNATIONAL CODE OF SIGNALS	
LIST OF AIDS TO NAVIGATION	

## GPS RECEIVERS - (Part XI)

NUMBER OF RECEIVERS	TYPE AND DESCRIPTION

8. AMENDMENTS AND ALTERATIONS TO EQUIPMENT AND INSTALLATIONS DURING PERIOD OF VALIDITY OF CERTIFICATE FROM ..... TO .....

[illegible]

[illegible]



SCHEDULE III  
EXEMPTION CERTIFICATE  
(REGULATION 27(3))

*Safety Regulations for Non-Convention Vessels Operating in Solomon Islands*  
EXEMPTION CERTIFICATE

(Official seal)

*Solomon Islands*

Issued under the provisions of the Safety Regulations for Non-Convention Vessels  
Operating in Solomon Islands

under the authority of the Government of

SOLOMON ISLANDS

by ~~MARINE DIVISION~~

Name of ship	Official No. and call sign	Port of registry	Date of build	Gross tonnage or Length (m)	IMO No.

THIS IS TO CERTIFY:

That the ship is, under the authority conferred by section ..... of the  
Regulations, exempted from the requirements of .....  
..... of the regulations.  
Conditions, if any, on which the Exemption Certificate is granted:

This certificate is valid until ..... subject to the Solomon Islands  
Safety Certificate to which this certificate is attached, remaining valid.

Issued at .....

(Place of issue of certificate)

.....  
(Date of issue)

.....  
Signature of authorized official issuing the certificate)

(Seal or stamp of the issuing authority as appropriate)

SCHEDULE IV  
(REGULATION 35(2))

**TOTAL NUMBER OF WATERTIGHT BULKHEADS TO BE FITTED**

The total number of watertight bulkheads required by Regulation 35(2), including the collision bulkhead, shall not be less than specified in the following table:

Length of vessel	Total number of bulkheads	
	Machinery amidships	Machinery aft
[20]m and over but less than 65m	4	3
65m and over but less than 85m	4	4

SCHEDULE V  
(REGULATION 37(1))

ANCHOR MASS AND CABLE SIZE

1. The following table specifies the minimum weight for each anchor required to be fitted to a vessel. Where a vessel has unusually high freeboard and/or a high or extensive superstructure the weight of anchors fitted shall be demonstrated to be adequate and fit for the purpose intended. Nothing in this Schedule shall prevent a vessel being fitted with anchors in accordance with the requirements of a classification society.

Length of vessel	Unlimited coastal	& Near-coastal	Inshore	
	Stockless <sup>7</sup>	HHP <sup>8</sup>	Stockless	HHP
[20]m and over but less than 25m	165kg	130kg	100kg	70kg
25m and over and less than 30m	300kg	240kg	150kg	100kg
30m and over and less than 35m	390kg	300kg	200kg	130kg
35m and over	In accordance with or demonstrated to be equivalent to the requirements of a classification society			

2. The following table specifies the characteristics of anchor chain, cable or rope required to be fitted:

Mass of anchor	Unlimited & Near-coastal				Inshore			
	Chain link	Manila	Polypropylene	Nylon	Chain link	Manila	Polypropylene	Nylon
	dia.	dia.	dia.	dia.	dia.	dia.	dia.	dia.
	Mm	mm	mm	mm	mm	mm	mm	mm
Less than 70%	14	34	28	20	13	24	18	14
70 to 89kg	14	38	32	22	14	36	30	22
90 to 129kg	15	- <sup>9</sup>	-	-	15	48	40	30
130 to 189kg	16	-	-	-	16	52	46	34
190 to 239kg	17	-	-	-	17	56	48	36
240 to 299kg	19	-	-	-	19	60	52	38
300 to 399kg	21	-	-	-	20	-	-	-
400kg and over	In accordance with or demonstrated to be equivalent to the requirements of a classification society.							

<sup>7</sup> Admiralty pattern stockless anchor

<sup>8</sup> High holding power anchor such as Danforth or CQR

<sup>9</sup> - indicates that rope is not permitted

SCHEDULE IV  
(REGULATION 40(2))

VI

### INTACT AND DAMAGE STABILITY CRITERIA

#### 1. General stability criteria applicable to all vessels

1.1 In all loading conditions the area under the righting lever curve (GZ curve) shall be not less than 0.055 metre-radian up to  $H=30^\circ$  angle of heel and not less than 0.09 metre-radian up to  $H=40^\circ$  or the angle of flooding  $H_f$  if this angle is less than  $40^\circ$ . Additionally, the area under the righting lever curve between the angles of heel of  $30^\circ$  and  $40^\circ$  or between  $30^\circ$  and  $H_f$  if this angle is less than  $40^\circ$ , shall not be less than 0.03 metre-radian.

1.2 The righting lever GZ shall be at least 0.2m at an angle of heel equal to or greater than  $30^\circ$ .

1.3 The maximum righting arm shall occur at an angle of heel preferably exceeding  $30^\circ$  but not less than  $20^\circ$ .

1.4 The initial metacentric height  $GM_0$  shall not be less than 0.15m.

1.5 Where passengers are carried, the angle of heel on account of the maximum number of passengers permitted to be carried assumed to be crowded to one side as defined in paragraphs 3.5.2.6 to 3.5.2.9 of the Stability Code shall not exceed  $10^\circ$ .

1.6 Where anti-rolling devices are installed in a vessel, it shall be demonstrated that the above criteria can be maintained when the devices are in operation.

1.7 Provisions shall be made for a safe margin of stability at all stages of the voyage, regard being given to additions of weight such as those due to absorption of water and to losses of weight such as those due to consumption of fuel and stores.

#### 2 Stability criteria applying to fishing vessels over 24m

2.1 In determining the righting lever curves (GZ curves) for the purposes of 2.2 account shall be taken of the following:

- (a) allowance for the weight of wet fishing nets and other fishing gear on the deck; and
- (b) homogeneous distribution of the catch, unless this is inconsistent with practice; and
- (c) catch on deck, if anticipated, in operating conditions referred to in rules 40.33(2)(b)(ii), (iii) and (v); and
- (d) water ballast if carried; and
- (e) allowance for the free surface effect of liquids and, if applicable, catch carried.

## 2.2 In all loading conditions:

2.2.1 The area under the righting lever curve (GZ curve) shall not be less than 0.055 metre-radians up to 30° angle of heel and not less than 0.090 metre-radians up to 40°. Additionally, the area under the righting lever curve (GZ curve) between the angles of heel of 30° and 40° or between 30° and  $\theta_F$  if this angle is less than 40° shall not be less than 0.03 metre-radians.  $\theta_F$  is the angle of heel at which openings in the hull, superstructure or deckhouses that cannot rapidly be closed weathertight begin to immerse.

2.2.2 The righting lever (GZ) shall be at least 200 millimetres at an angle of heel equal to or greater than 30°.

2.2.3 The maximum righting lever ( $GZ_{max}$ ) shall occur at an angle of heel preferably exceeding 30° but not less than 25°.

2.2.4 The initial metacentric height (GM) shall not be less than 350 millimetres for single deck ships. For ships of 70 metres in length and over with complete superstructure, the metacentric height may be reduced to the satisfaction of the surveyor, but is in no case to be less than 150 millimetres.

2.2.5 The range of positive stability shall not be less than 60°. The effects of enclosed deck erections with openings closed by approved weathertight fittings may be taken into account in determining the range of positive stability.

2.3 The angle of heel at which progressive flooding of fish holds could occur through hatches that remain open during fishing operations and that cannot rapidly be closed, shall be at least 20°, unless the stability criteria of 2.2 can be satisfied with the respective fish holds partially or completely flooded.

## 3 Standard loading conditions to be examined

3.1 For a passenger ship and a cargo-passenger ship:

3.1.1 ship in the fully loaded departure condition with any cargo homogeneously distributed throughout all cargo spaces, full stores and fuel and with the full number of passengers with their luggage;

3.1.2 ship in the fully loaded arrival condition, with any cargo homogeneously distributed throughout all cargo spaces, the full number of passengers and their luggage but with only 10% stores and fuel remaining;

3.1.3 ship without cargo, but with full stores and fuel and the full number of passengers and their luggage; and

3.1.4 ship in the same condition as at 3.1.3 above with only 10% stores and fuel remaining.

3.2 For a cargo ship:

3.2.1 Ship in the fully loaded departure condition with cargo homogeneously distributed throughout all cargo spaces and with full stores and fuel;

3.2.2 Ship in the fully loaded arrival condition with cargo homogeneously distributed throughout all cargo spaces and with 10% stores and fuel remaining;

3.2.3 Ship in ballast in the departure condition, without cargo but with full stores and fuel; and

3.2.4 Ship in ballast in the arrival condition, without cargo and with 10% stores and fuel remaining.

3.3 For a cargo ship intended to carry deck cargoes:

3.3.1 Ship in the fully loaded departure condition with cargo homogeneously distributed in the holds and with cargo specified in position and weight on deck, with full stores and fuel; ship in ballast in the arrival condition, without cargo and with 10% stores and fuel remaining; and

3.3.2 Ship in the fully loaded arrival condition with cargo homogeneously distributed in holds and with a cargo specified in position and weight on deck, with 10% stores and fuel.

3.4 For a fishing vessel:

3.4.1 departure for the fishing grounds with full fuel, stores, ice, and fishing gear; and

3.4.2 departure from the fishing grounds with full catch; and

3.4.3 arrival at home port with full catch and 10% fuel and stores; and

3.4.4 arrival at home port with 10% fuel, stores, and a minimum catch, that is normally to be 20% of a full catch but may be up to 40%, provided the surveyor is satisfied that operating patterns justify such a value; and

3.4.5 any other actual operating conditions the surveyor considers would produce the lowest values of the parameters contained in the criteria required by 2 above.

#### 4. Minimum stability criteria for vessels of less than 24m in length

4.1 For decked vessels having a length of less than 24m, the minimum metacentric height  $GM_{min}$  may be taken as

$$GM_{min} = 0.53 + 2B [0.075 - 0.37 f/B + 0.82 (f/B)^2 - 0.014B/D - 0.0321/L]$$

Where:

L is the length of the vessel on the waterline in maximum load condition (m)

$l_s$  is the actual length of enclosed superstructure extending from side to side of the vessel

B is the extreme breadth of the vessel on the waterline in maximum load condition (m)

D is the depth of the vessel measured vertically from the base line to the top of the upper deck at side (m)

f is the smallest freeboard measured vertically from the top of the upper deck at side to the actual waterline (m)

4.2 The approximation in 4.1 is applicable to vessels having the following characteristics:

$f/B$  between 0.02 and 0.20

$l_s/L$  smaller than 0.60

$B/D$  between 1.75 and 2.15

Sheer fore and aft at least equal to the standard sheer prescribed in regulation 38(8) of the International Convention on Load Lines, 1966

Height of superstructure included in the calculation not less than 1.8m

4.2.1 For ships having parameters outside the above limits, the approximation should be applied with particular care.

4.3 The approximation in 4.1 is not intended as a replacement for the basic criteria given in 1 but should only be used if cross curves of stability, KM (keel to transverse metacentre distance) curve and corresponding GZ curves are not available for judging a vessel's stability.

4.4 The calculated value of  $GM_{min}$  should be compared with actual  $GM$  values of the vessel in all loading conditions. If a rolling test (see 7.6 of the Stability Code), an inclining experiment based on estimated displacement, or another approximate method of determining the actual  $GM$  is used, a safety margin should be added to the calculated  $GM_{min}$ .

## 5. Damage stability of passenger ships

### 5.1 Damage assumptions

5.1.1 The requirements of this section apply to all permitted conditions of loading.

5.1.2 For the purpose of making damage stability calculations, the permeabilities assumed should be in general as follows:

Spaces	Permeability
Appropriated to cargo or stores	60
Occupied by accommodation	95
Occupied by machinery	85
Intended for liquids	0 or 95*
Appropriated for cargo vehicles	90
Void spaces	95

\* whichever results in the more severe requirement

5.1.3 Notwithstanding 5.1.2, permeability determined by direct calculation should be used where a more onerous condition results, and may be used where a less onerous condition results from that provided according to 5.1.2.

5.1.4 Administrations may permit the use of low-density foam or other media to provide buoyancy in void spaces, provided that satisfactory evidence is provided that any such proposed medium is the most suitable alternative and is:

- (a) of closed-cell form if foam, or otherwise impervious to water absorption;
- (b) structurally stable under service conditions;
- (c) chemically inert in relation to structural materials with which it is in contact or other substances with which the medium is likely to be in contact
- (d) protected from fire hazards; and
- (e) properly secured in place and easily removeable for inspection of the void spaces.

5.1.5 Any damage of a lesser extent than that postulated in 5.1.6 to 5.1.8, which would result in a more severe condition, should also be investigated. The shape of the damage should be assumed to be a parallelepiped.

5.1.6 The following side damages should be assumed anywhere on the periphery of the craft:

- (a) the longitudinal extent of damage should be  $0.1L$ , or  $3m + 0.03L$  or  $11m$  whichever is the least;
- (b) the transverse extent of penetration into the craft should be  $0.2B$  or  $0.05L$  or  $5m$ , whichever is the least. However, where the craft is fitted with inflated skirts or with non-buoyant side structures, the transverse extent of penetration should be at least  $0.12$  of the width of the main buoyancy hull or tank structure; and
- (c) the vertical extent of damage should be taken for the full depth of the craft.

5.1.7 Bottom damage should be assumed anywhere on the bottom of the craft as follows:

- (a) the longitudinal extent of damage should be  $0.1L$  or  $3m + 0.03L$  or  $11m$ , whichever is the least;
- (b) the transverse extent of damage should be the full breadth of the bottom of the craft or  $7m$ , whichever is the less, as shown in figure 5; and
- (c) the vertical extent of penetration into the craft should be  $0.02B$  or  $0.5m$ , whichever is the less.

5.2 Following any of the postulated damages detailed in 5.1, the craft in still water should have sufficient buoyancy and positive stability to simultaneously ensure that:

5.2.1 After flooding has ceased and a state of equilibrium has been reached, the final waterline be  $300mm$  below the level of any opening through which further flooding could take place;

5.2.2 The angle of inclination of the craft from the horizontal does not normally exceed  $10^\circ$  in any direction. However, where this is clearly impractical, angles of inclination up to  $15^\circ$  immediately after damage but reducing to  $10^\circ$  within 15 minutes may be permitted provided that efficient non-slip deck surfaces and suitable holding points, e.g., holes, bars, etc., are provided;

5.2.3 There is a positive freeboard from the damage waterline to survival craft embarkation positions;

5.2.4 Any flooding of passenger compartments or escape routes, which might occur, will not significantly impede the evacuation of passengers;

5.2.5 Essential emergency equipment, emergency radios, power supplies and public address systems needed for organizing the evacuation remain accessible and operational;

5.2.6 The residual stability of a multihull vessel complies with the appropriate criteria as laid out in Annex 7 of the IMO HSC Code; and

5.2.7 Residual stability of any other vessel meets the requirements of regulation II-1/8 of the Convention or other standard considered appropriate by the Administration.

## 6. Intact stability requirements for barges

6.1 The criteria set out below should be applied having regard to the provisions of 4.7 of the Stability Code.



6.2 The area under a righting lever curve up to the angle of maximum righting lever should not be less than 0.08 metre-radian.

6.3 The static angle of heel due to a uniformly distributed wind load of 0.54kPa (wind speed of 30m/s) should not exceed an angle corresponding to half the freeboard for the relevant loading condition, where the lever of wind heeling moment is measured from the centroid of the windage area to half the draught.

6.4 The minimum range of stability should be:

For L equal to or less than 100m	20 degrees
For L equal to or greater than 150m	15 degrees

For intermediate lengths the minimum range should be obtained by linear interpolation.

**7. Determination of vessel's stability by means of rolling period tests  
(for vessels up to 70 metres in length)**

7.1 The IMO, recognizing the desirability of supplying to masters of small vessels instructions for a simplified determination of initial stability, developed a standard for the performance of rolling period tests. It was concluded that the rolling period test was a useful means of approximately determining the initial stability of small vessels when it is not practicable to give approved loading conditions or other stability information, or as a supplement to such information. Accordingly, the IMO incorporated this guidance in 7.6 of the Code on intact stability for all types of ships covered by IMO instruments. The following duplicates this guidance in a form appropriate to the Pacific Regulations.

7.2 Investigations comprising the evaluation of a number of inclining and rolling tests according to various formulae showed that the following formula gave the best results and has the advantage of being the simplest:

$$GM_O = (f \times B / T_r)^2$$

where:

f = factor for the rolling period (rolling coefficient) as given in 7.4;  
 B = breadth of the vessel in metres;  
 T<sub>r</sub> = time for a full rolling period in seconds (i.e. for one oscillation "to and fro" port - starboard - port, or vice versa).

7.3 The factor f is of the greatest importance and the data from the above tests were used for assessing the influence of the distribution of the various masses in the whole body of the loaded vessel.

7.4 For coasters of normal size (excluding tankers) and fishing vessels, the following average values were observed:

	f values (approximate)
Empty vessel or vessel carrying ballast	0.88
Vessel fully loaded and with liquids in tanks comprising the following percentage of the total load on board (i.e. cargo, liquids, stores, etc.):	
20% of total load	0.78
10% of total load	0.75
5% of total load	0.73
Double-boom shrimp fishing boats <sup>1</sup>	0.95
Deep-sea fishing boats <sup>2</sup>	0.80
Boats with live fish well <sup>2</sup>	0.60

<sup>1</sup> The stated values are mean values. Generally, f values observed during the tests were within  $\pm 0.05$  of those given above.

<sup>2</sup> Although the values are given for fishing vessels, they provide guidance on the f values applicable to other types of vessel of similar form (see also C.7.5)

7.5 The tabulated f values were based upon a series of limited tests and therefore it is recommended that Administrations should re-examine these values in the light of any different circumstances applying to their own vessels. It would be of advantage to Administrations to collect and analyse information on the stability and f values of vessels within their own jurisdictions in order to reflect accurately the application of stability criteria obtained from rolling tests to typical vessel types.

7.6 It should be noted that the greater the distance of masses from the rolling axis, the greater the rolling coefficient will be. Therefore it can be expected that: the rolling coefficient for an unloaded vessel will be higher than that for a loaded vessel and the rolling coefficient for a vessel carrying a great amount of bunkers and ballast - both groups are usually located in the double bottom, i.e. far away from the rolling axis - will be higher than that of the same vessel having an empty double bottom.

7.7 The rolling coefficients recommended above were determined by tests with vessels in port and with their consumable liquids at normal working levels; thus the influences exerted by the vicinity of the quay, the limited depth of water and the free surfaces of liquids in service tanks are included.

7.8 Experiments have shown that the results of the rolling test method get increasingly less reliable the nearer they approach GM values of 0.26m and below.

7.9 For the following reasons, it is not generally recommended that results be obtained from rolling oscillations taken in a seaway:

- (a) exact coefficients for tests in open waters are not available;
- (b) the rolling periods observed may not be free oscillations but forced oscillations due to the seaway;
- (c) frequently in a seaway, oscillations are either irregular or only regular for too short an interval of time to allow accurate measurements to be observed; and
- (d) specialized recording equipment is necessary.

7.10 However, sometimes it may be desirable to use the vessel's period of roll as a means of approximately judging the stability at sea. If this is done, care should be taken to discard readings, which depart appreciably from the majority of other observations. Forced oscillations corresponding to the sea period and differing from the natural period at which the vessel seems to move should be disregarded. In order to obtain satisfactory results, it may be necessary to select intervals when the sea action is least violent and it may be necessary to discard a considerable number of observations.

7.11 In view of the foregoing circumstances, it needs to be recognized that the determination of the stability by means of the rolling test in a seaway should only be regarded as a very approximate estimation.

7.12 The formula given in paragraph 7.2 can be reduced to:

$$GMO = F / T_r^2$$

Where  $F$  = a modified factor for the rolling period

If this formulation is adopted it is suggested, in line with the advice in 7.5, that the Administration should determine the  $F$  value(s) applicable to vessels within their jurisdictions.

7.13 The determination of the stability can be simplified by giving the master permissible rolling periods, in relation to the draughts, for the appropriate value(s) of  $F$  considered necessary.

7.14 An approach to determining the initial stability of a vessel by means of a nomogram is described in the Code on intact stability for all types of ships covered by IMO instruments.

7.15 Section 7.16 shows an example of a recommended form in which these instructions might be presented by the Administration to the masters. Each Administration should recommend the  $F$  values to be used on the basis of its own experience.

## 8. Recommendations on procedures for the conduct of rolling tests

8.1 The rolling period required is the time for one complete oscillation of the vessel and to ensure the most accurate results in obtaining this value the following precautions should be observed.

8.2 The test should be conducted with the vessel in harbour, in smooth water with the minimum interference from the wind and tide.

8.3 Starting with the vessel at the extreme end of a roll to one side (say port) as the vessel about to move towards the upright, one complete oscillation will have been made when the vessel has moved right across to the other extreme side (i.e. starboard) and returned to the original starting point and is about to commence the next roll.

8.4 By means of a stop-watch, the time should be taken for not less than about five complete oscillations. Counting of the oscillations should begin when the vessel is at the extreme end of a roll. After allowing the roll to completely die away, this operation should be repeated at least twice more. If possible, in every case the same number of complete oscillations should be timed to establish that the readings are consistent, i.e. repeating themselves within reasonable limits. Knowing the total time for the total number of oscillations made, the mean time for one complete oscillation can be calculated.

8.5 The vessel can be made to roll by rhythmically lifting up and putting down a weight as far off the centreline as possible; by pulling on the mast with a rope; by people running athwartships in unison; or by any other means. However, and this is most important, as soon as this forced rolling has commenced, the means by which it has been induced should be stopped and the vessel allowed to roll freely and naturally. If rolling has been induced by lowering or raising a weight it is preferable that the weight is moved by a dockside crane. If the vessel's own derrick is used, the weight should be placed on the deck, at the centreline, as soon as the rolling is established.

8.6 The timing and counting of the oscillations should only begin when it is judged that the vessel is rolling freely and naturally, and only as much as is necessary to accurately count these oscillations.

8.7 The mooring should be slack and the vessel breasted off to avoid making contact with the wharf or any other structure during its rolling. To check this, and also to get some idea of the number of oscillations that can be reasonably counted and timed, a preliminary rolling test should be made before starting to record actual time.

8.8 Care should be taken to ensure that there is a reasonable clearance of water under the keel and at the sides of the vessel.

8.9 Weights of reasonable size which are liable to swing (e.g. a lifeboat), or liable to move (e.g. a drum), should be secured against such movement.

8.10 The free surface effects of slack tanks should be kept as small as is practicable during the test.

8.11 Limitations on the use of this method

8.11.1 A long period of roll, corresponding to a G.M. of 0.20m or below, indicates a condition of low stability. However, under such circumstances, accuracy in determination of the actual value of  $GM_0$  is reduced.

8.11.2 If, for some reason, these rolling tests are carried out in open, deep but smooth waters, inducing the roll, for example, by putting over the helm, then the G.M. calculated by using the method and coefficient of paragraph 7.16.1 above should be reduced by a figure to be estimated by the Administration to obtain the final answer.

8.11.3 The determination of stability by means of the rolling test in disturbed waters should only be regarded as a very approximate estimation. If such a test is performed, care should be taken to discard readings, which depart appreciably from the majority of other observations. Forced oscillations corresponding to the sea period and differing from the natural period at which the vessel seems to move should be disregarded. In order to obtain satisfactory results, it may be necessary to select intervals when the sea action is least violent and it may be necessary to discard a considerable number of observations.

#### SCHEDULE VII (REGULATION 41)

#### STABILITY INFORMATION

##### 1 Stability booklet

1.1 Stability data and associated plans should be drawn up in the official language or languages of the issuing country and the language of the master. If the languages used are neither English nor French the text should include a translation into one of these languages.

1.2 Each ship should be provided with a stability booklet, approved by the Administration, which contains sufficient information to enable the master to operate the ship in compliance with the applicable requirements contained in the Code.

1.3 The format of the stability booklet and the information included will vary depending on the ship type and operation. In developing the stability booklet, consideration should be given to including the following information:

1.3.1 a general description of the ship;

1.3.2 instructions on the use of the booklet;

1.3.3 general arrangement plans showing watertight compartments, closures, vents, downflooding angles, permanent ballast, allowable deck loadings and freeboard diagrams;

- 1.3.4 hydrostatic curves or tables and cross-curves of stability calculated on a free-trimming basis, for the ranges of displacement and trim anticipated in normal operating conditions;
- 1.3.5 capacity plan or tables showing capacities and centres of gravity for each cargo stowage space;
- 1.3.6 tank sounding tables showing capacities, centres of gravity, and free surface data for each tank;
- 1.3.7 information on loading restrictions, such as maximum KG or minimum GM curve or table that can be used to determine compliance with the applicable stability criteria;
- 1.3.8 standard operating conditions and examples for developing other acceptable loading conditions using the information contained in the stability booklet;
- 1.3.9 a brief description of the stability calculations done, including assumptions;
- 1.3.10 general precautions for preventing unintentional flooding;
- 1.3.11 information concerning the use of any special cross-flooding fittings with descriptions of damage conditions which may require cross-flooding;
- 1.3.12 any other necessary guidance for the safe operation of the ship under normal and emergency conditions;
- 1.3.13 a table of contents and index for each booklet;
- 1.3.14 inclining test report for the ship, or, where the stability data are based on a sister ship, the inclining test report of that sister ship along with the lightweight survey report for the ship in question. Alternatively, where lightweight particulars are determined by other methods than from inclining of the ship or its sister, a summary of the method used to determine those particulars may be provided;
- 1.3.15 recommendation for determination of ship's stability by means of an in-service inclining test

1.4 As an alternative to the stability booklet mentioned in 1.2, regulation 41(4) of the Regulations provides that a simplified booklet in accordance with 2 and containing sufficient information to enable the master to operate the ship in compliance with the applicable provisions of the regulations may be provided at the discretion of the Administration.

1.5 As a supplement to the approved stability booklet, a loading computer may be used to facilitate the stability calculations mentioned in paragraph 1.3.9.

1.6 It is desirable that the input/output from the computer and screen presentation be similar to the one in the stability booklet so that the operators will easily gain familiarity with the use of the stability booklet.

1.7 A simple and straightforward instruction manual, written in accordance with sound marine practice and in a language common to all officers, should be provided with the loading computer;

1.8 In order to validate the proper functioning of the computer program, four loading conditions taken from the stability booklet (final) should be run in the computer periodically and the printouts should be maintained on board as check conditions for future reference.

SCHEDULE VIII  
(REGULATION 43)

**BILGE PUMPING ARRANGEMENTS**

**1 General**

1.1 Subject to paragraph 1.2 every vessel shall be provided with a pumping system capable of pumping from and draining any watertight compartment in the vessel.

1.2 A watertight compartment less than 7% of the total underdeck volume may be drained into the adjacent compartment by means of a self-closing valve or cock. The valve or cock shall be fitted outside the compartment to be drained and shall be operable from a readily accessible position.

1.3 In the case of a passenger vessel of 15m in length and over the system shall permit pumping and draining from every space in the vessel whilst any one watertight compartment is flooded.

**2 Number and capacity of pumps**

Vessels shall be provided with bilge pumps in accordance with the following table:

Measured length of vessel in m	Manual pumps discharge capacity as installed		Power pumps discharge capacity as installed	
	No	Capacity in kilolitres/hr	No	Capacity in kilolitres/hr
10m and over and less than 12.5m	1	5.5	1	5.5
12.5m and over and less than 17.5m	1	5.5	1	11.0
17.5m and over and less than 20m	1	8.0	1	11.0
20m and over and less than 25m	Not	permitted	2	11.0
25m and over and less than 35m	Not	permitted	2	15.0

**3 Pump details**

3.1 In any vessel:

3.1.1 a power pump may be substituted for a manually operated pump;

3.1.2 a power pump may be driven by a main engine, an auxiliary engine or by an electric motor. However, where 2 power pumps are required, each pump shall not be dependent on the same source of power.

3.1.3 where a vessel is required by 2 to be fitted with 2 power pumps and the capacity of one of those pumps is less than that specified by not more than 20% the deficiency may be made good by an excess of capacity in the other power pump; and

3.1.4 a bilge pump shall be of the self-priming type or be provided with a suitable priming device

#### 4 Pipe Materials

- 4.1 All bilge piping shall be of steel or heavy gauge copper.
- 4.2 Notwithstanding the provisions of 4.1 and subject to 4.3, reinforced synthetic rubber piping may be used as tail pipes.
- 4.3 Where the Administration permits the use of non-metallic bilge piping in particular circumstances it shall have a high resistance to salt water, fuel oil, heat and vibration and be capable of operating under suction without collapse and resultant reduction in effective area.

#### 5 Strainers

- 5.1 On vessels of 20m in length and above each bilge suction in a machinery space shall be fitted with a mudbox and metallic tail pipe. All other bilge suction shall be fitted with a mudbox, strum box or strainer. Special consideration shall be given to the accessibility of bilge suction.
- 5.2 Strainer holes shall not be greater than 10mm diameter and the aggregate area of the holes shall not be less than twice the area of the suction pipe.

#### 6 Back-Flooding

- 6.1 Bilge piping arrangements shall be so arranged as to prevent water passing from the sea into holds or machinery spaces, or where the length of a vessel is 25m and over from one watertight compartment to another. The bilge connection to any pump, which also draws from the sea, shall be either a screw down non-return valve, or a cock, which cannot be opened at the same time to the bilges and to the sea. Where the length of a vessel is 25m and over valves in bilge distribution boxes shall be non-return valves.

#### 7. Pipe Sizes

- 7.1 In vessels of 10m and over in length the diameter of bilge suction pipes is to be not less than that determined by the following formula:

$$7.1.1 \quad d_m = 5 + 1.68 (L (B + D))^{1/2}$$

$$d_b = 25 + 2.16 (C (B + D))^{1/2}$$

where  $d_m$  = internal diameter of the main bilge suction pipe in mm

$d_b$  = internal diameter of branch suction pipes in mm

L = length of the vessel in m

B = breadth of vessel in m

D = depth of vessel in m

C = length of compartment in m

- 7.1.2 No main or branch suction piping is to be less than 32 mm in diameter.



## **8 Bilge Level Alarm**

8.1 In all decked vessels the space in which the propulsion machinery is located shall be fitted with a bilge level device, which is connected to an audible alarm, located near the steering position. The power supply for the audible alarm shall be available at all times there is any person on board. With the machinery operating under full power conditions the alarm shall, when operated, be clearly audible at the steering position.

### **SCHEDULE IX (REGULATION 52(1))**

#### **RECOMMENDED NOISE LEVELS ON BOARD VESSELS**

##### **1 Noise level limits in work spaces**

F.1.1	continuously manned machinery spaces	90 dBA
F.1.2	non-continuously manned machinery spaces	110dBA
F.1.3	machinery control rooms	75 dBA
F.1.4	Workshops	85 dBA
F.1.5	work spaces not elsewhere specified	90 dBA

##### **2 Noise level limits in navigation spaces**

F.2.1	navigating bridge and chartroom	65 dBA
F.2.2	navigation bridge wings and in way of windows	70 dBA
F.2.3	radio rooms (radio not producing audio signals)	60 dBA
F.2.4	radar rooms	65 dBA

##### **3 Noise level limits in accommodation spaces**

F.3.1	cabins and hospitals	60 dBA
F.3.2	mess rooms and recreation rooms	65 dBA
F.3.3	open recreation areas	75 dBA
F.3.4	Offices	65 dBA

4. Noise level limits in service spaces

- F.4.1 galleys (food processing machinery not operating) 75 dBA  
 F.4.2 serveries and pantries 75 dBA

5. Noise level limits in spaces not normally occupied

- F.5.1 all spaces not elsewhere specified 90 dBA

SCHEDULE X  
 (REGULATION 64(14))

INTERNATIONAL SHORE CONNECTION

- 1 Dimensions of flanges shall be in accordance with the following table:

Description	Dimension
Outside diameter	178mm
Inside diameter	64mm
Bolt circle diameter	132mm
Slots in flange	Four holes, 19mm in diameter spaced equidistantly on the above bolt circle diameter, slotted to the flange periphery
Flange thickness	14.5mm minimum
Bolts and nuts	Four, each of 16mm diameter and 50mm length

G.2 The connection shall be of steel or other suitable material and shall be designed for 1.0N/mm<sup>2</sup> services.

G3. The flange shall have a flat face on one side and on the other shall be permanently attached to a coupling that will fit the vessel's hydrant and hose. The connection shall be kept aboard the vessel together with a gasket of any material suitable for 1.0N/mm<sup>2</sup> services, together with four bolts and nuts in accordance with 1 and eight washers.

SCHEDULE XI  
(REGULATION)

SOLAS CHAPTER VII - PART A

Part A

Carriage of dangerous goods in packaged form  
or in solid form in bulk<sup>10</sup>

**Regulation 1**

*Application*

1 Unless expressly provided otherwise, this part applies to dangerous goods classified under regulation 2 which are carried in packaged form or in solid form in bulk (hereinafter referred to as "dangerous goods"), in all ships to which the present regulations apply and in cargo ships of less than 500 gross tonnage.

2 The provisions of this part do not apply to ships' stores and equipment.

3 The carriage of dangerous goods is prohibited except in accordance with the provisions of this part.

4 To supplement the provisions of this part, each Contracting Government shall issue, or cause to be issued, detailed instructions on safe packaging and stowage of dangerous goods which shall include the precautions necessary in relation to other cargo<sup>11</sup>.

**Regulation 2**

*Classification*

Dangerous goods shall be divided into the following classes:

Class 1	Explosives
Class 2	Gases: compressed, liquefied or dissolved under pressure
Class 3	Flammable <sup>12</sup> liquids
Class 4.1	Flammable solids
Class 4.2	Substances liable to spontaneous combustion
Class 4.3	Substances which, in contact with water, emit flammable gases
Class 5.1	Oxidizing substances
Class 5.2	Organic peroxides
Class 6.1	Poisonous (toxic) substances
Class 6.2	Infectious substances
Class 7	Radioactive materials
Class 8	Corrosives
Class 9	Miscellaneous dangerous substances, that is any other substance which experience has shown, or may show, to be of such a dangerous character that the provisions of this part shall apply to it.

<sup>10</sup> Refer to MSC/Circ.559, Form for reporting incidents involving dangerous goods and marine pollutants in packaged form on board ships and in port areas.

<sup>11</sup> Refer to the International Maritime Dangerous Goods Code (IMDG Code), adopted by the Organization by resolution A.716(17), and to the relevant sections and the related parts of appendix B of the Code of Safe Practice for Solid Bulk Cargoes (BC Code), adopted by the Organization A.434(XI), as may be amended by the Maritime Safety Committee.

<sup>12</sup> "Flammable" has the same meaning as "inflammable"

**Regulation 3***Packaging*

- 1 The packaging of dangerous goods shall be:
  - (1) well made and in good condition
  - (2) of such a character that any interior surface with which the contents may come in contact is not dangerously affected by the substance being conveyed; and
  - (3) capable of withstanding the ordinary risks of handling and carriage by sea.
- 2 Where the use of absorbent or cushioning material is customary in the packaging of liquids in receptacles, that material shall be:
  - (1) capable of minimizing the dangers to which the liquid may give rise
  - (2) so disposed as to prevent movement and ensure that the receptacle remains surrounded; and
  - (3) where reasonably possible, of sufficient quantity to absorb the liquid in the event of breakage of the receptacle.
- 3 Receptacles containing dangerous liquids shall have an ullage at the filling temperature sufficient to allow for the highest temperature during the course of normal carriage.
- 4 Cylinders or receptacles for gases under pressure shall be adequately constructed, tested, maintained and correctly filled.
- 5 Empty uncleaned receptacles which have been used previously for the carriage of dangerous goods shall be subject to the provisions of this part for filled receptacles, unless adequate measures have been taken to nullify any hazard.

**Regulation 4***Marking, labelling and placarding*

- 1 Packages containing dangerous goods shall be durably marked with the correct technical name; trade names alone shall not be used.
- 2 Packages containing dangerous goods shall be provided with distinctive labels or stencils of the labels, or placards, as appropriate, so as to make clear the dangerous properties of the goods contained therein.
- 3 The method of marking the correct technical name and of affixing labels or applying stencils of labels, or of affixing placards on packages containing dangerous

goods, shall be such that this information will still be identifiable on packages surviving at least three months' immersion in the sea. In considering suitable marking labelling and placarding methods, account shall be taken of the durability of the materials used and of the surface of the package.

4 Packages containing dangerous goods shall be so marked and labelled except that:

- (1) packages containing dangerous goods of a low degree of hazard or packed in limited quantities<sup>13</sup>; or
- (2) when special circumstances permit, packages that are stowed and handled in units that are identified by labels or placards; may be exempted from labelling requirements.

#### **Regulation 5** *Documents*

1 In all documents relating to the carriage of dangerous goods by sea where the goods are named, the correct technical name of the goods shall be used (trade names alone shall not be used) and the correct description given in accordance with the classification set out in regulation 2.

2 The shipping documents prepared by the shipper shall include, or be accompanied by, a signed certificate or declaration that the shipment offered for carriage is properly packaged and marked, labelled or placarded, as appropriate, and in proper condition for carriage.

3 The persons responsible for the packing of dangerous goods in a freight container or road vehicle shall provide a signed container packing certificate or vehicle packing declaration stating that the cargo in the unit has been properly packed and secured and that all applicable transport requirements have been met. Such a certificate or declaration may be combined with the document referred to in paragraph 2.

4 Where there is due cause to suspect that a freight container or road vehicle in which dangerous goods are packed is not in compliance with the requirements of paragraph 2 or 3, or where a container packing certificate or vehicle packing declaration is not available, the freight container or vehicle shall not be accepted for shipment.

5 Each ship carrying dangerous goods shall have a special list or manifest setting forth, in accordance with the classification set out in regulation 2, the dangerous goods on board and the location thereof. A detailed stowage plan, which identifies by class and sets out the location of all dangerous goods on board, may be used in place of such a special list or manifest. A copy of one of these documents shall be made available before departure to the person or organization designated by the port State authority.

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<sup>13</sup> Refer to the specific exemptions provided for in the IMDG Code

**Regulation 6***Stowage requirements*

- 1 Dangerous goods shall be loaded, stowed and secured safely and appropriately in accordance with the nature of the goods. Incompatible goods shall be segregated from one another.
- 2 Explosives (except ammunition) which present a serious risk shall be stowed in a magazine which shall be kept securely closed while at sea. Such explosives shall be segregated from detonators. Electrical apparatus and cables in any compartment in which explosives are carried shall be so designed and used as to minimize the risk of fire or explosion.
- 3 Dangerous goods in packaged form which give off dangerous vapours shall be stowed in a mechanically ventilated space or on deck. Dangerous goods in solid form in bulk which give off dangerous vapours shall be stowed in a well ventilated space.
- 4 In ships carrying flammable liquids or gases, special precautions shall be taken where necessary against fire or explosion.
- 5 Substances, which are liable to spontaneous heating or combustion, shall not be carried unless adequate precautions have been taken to minimize the likelihood of the outbreak of fire.
- 6 Cargo transport units, including freight containers, shall be loaded, stowed and secured throughout the voyage in accordance with the Cargo Securing Manual approved by the Administration. The Cargo Securing Manual shall be drawn up to a standard at least equivalent to the guidelines developed by the Organization<sup>14</sup>.

**Regulation 7***Explosives in passenger ships<sup>15</sup>*

- 1 Explosives in division 1.4, compatibility group S, may be carried in any amount in passenger ships. No other explosives may be carried except any one of the following:
  - (1) explosive articles for life-saving purposes, if the total net explosives mass of such articles does not exceed 50 kg per ship; or
  - (2) explosives in compatibility groups C, D and E, if the total net explosives mass does not exceed 10 kg per ship; or
  - (3) explosive articles in compatibility group G other than those requiring special stowage, if the total net explosives mass does not exceed 10 kg per ship; or

<sup>14</sup> refer to MSC/Circ.385 on the Cargo Securing Manual and MSC/Circ.745 on Guidelines for the preparation of the Cargo Securing Manual

<sup>15</sup> Refer to class 1 of the IMDG Code.

(4) explosive articles in compatibility group B, if the total net explosives mass does not exceed 5kg per ship.

2 Notwithstanding the provisions of paragraph 1; additional quantities or types of explosives may be carried in passenger ships in which special safety measures approved by the Administration are taken.

**Regulation 7-1**

*Reporting of incidents involving dangerous goods*

1 When an incident takes place involving the loss or likely loss overboard of packaged dangerous goods into the sea, the master, or other person having charge of the ship, shall report the particulars of such an incident without delay and to the fullest extent possible to the nearest coastal State. The report shall be based on the guidelines and general principles adopted by the Organization<sup>16</sup>.

2. In the event of the ship referred to in paragraph 1 being abandoned, or in the event of a report from such a ship being incomplete or unobtainable, the owner, charterer, manager or operator of the ship, or their agents shall, to the fullest extent possible, assume the obligations placed on the master by this regulation.

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<sup>16</sup> Refer to resolution A.648(16) General principles for ship reporting systems and ship reporting requirements, including guidelines for reporting incidents involving dangerous goods, harmful substance and or marine pollutants

SCHEDULE XII  
(REGULATION 92(2))

**LIFERAFT CONSTRUCTION AND CAPACITY**

**1 Construction of rigid coastal liferafts**

1.1 The liferaft shall be so constructed so that if it is dropped into the water from a height of 6m, or from its stowed position, whichever is the greater, neither the liferaft nor its equipment will be damaged.

1.2 The buoyancy of the liferaft shall be derived from a material having the properties detailed below:

Minimum density	32kg/m <sup>3</sup>
Minimum compressive strength at 10 per cent strain	235kPa
Minimum closed cell content	92 per cent
Maximum water uptake	400ml/m <sup>3</sup>
Self-extinguishing	to ASTM D1692/68
Maximum burning rate	100mm/minute
High resistance to kerosene, distillate, petrol and oils	

1.3 The liferaft shall be so constructed that 75 per cent of the buoyancy material is placed around its perimeter.

1.4 The buoyancy material shall be covered with an approved lay up of glass reinforced plastic or a casing of marine plywood (marine plywood shall comply with Australian Standard 2272); the covering shall be of a highly visible colour.

1.5 The equipment of the liferaft shall be so stowed as to be readily available whichever way up the liferaft is floating or may be stowed in a buoyant canister attached to the liferaft by a line.

1.6 The total mass of any liferaft shall not exceed 180kg.

1.7 The liferaft shall be effective and stable when floating either way up and in no case shall the water plane area be less than 1.5m<sup>2</sup>.

1.8 The liferaft shall have a painter attached, and a lifeline securely becketed round the outside. A lifeline shall also be fitted round the inside of the liferaft.

1.9 The liferaft shall be stowed so as to float free in the event of the vessel sinking.

1.10 The construction of the liferaft shall include a cover of a highly visible colour. This cover shall be capable of protecting the occupants against injury from exposure. The top and the inside of the cover shall be fitted with a lamp, which derives its power from a sea-activated cell.



11.1 The upper surface of the liferaft shall be fitted with retro-reflective tape not less than 50mm in width such that the liferaft is made visible to searching boats and aircraft.

## 2. Construction of inflatable coastal liferafts

2.1 The liferaft shall be so constructed that, when fully inflated and floating with the cover uppermost, it shall be stable in a seaway.

2.2 The liferaft shall be so constructed that if it is dropped into the water from a height of 6m or from its stowed position, whichever is the greater, neither the liferaft nor its equipment will be damaged.

2.3 The construction of the liferaft shall include a cover of a highly visible colour, capable of protecting the occupants against injury from exposure. The top and the inside of the cover shall be fitted with a lamp, which derives its power from a sea-activated cell.

2.4 The liferaft shall be fitted with a painter and shall have a line securely becketed around the outside, and a lifeline fitted around the inside.

2.5 The liferaft shall be capable of being readily righted by one person if it inflates in an inverted position.

2.6 The liferaft shall be fitted at each opening with efficient means to enable persons in the water to climb on board.

2.7 The liferaft shall be contained in a valise or other container so constructed as to be capable of withstanding hard wears under conditions met with a sea. The liferaft in such valise or container shall be inherently buoyant.

2.8 The buoyancy of the liferaft shall be divided into an even number of compartments, so arranged that either half of the total number of compartments is capable of supporting out of the water the number of persons in the carrying capacity of the liferaft.

2.9 The total mass of the liferaft and its equipment, contained in a valise or other container, shall not exceed 185kg, unless the liferaft is designed to be launched by a launching appliance, or a marine evacuation system, or is so stowed that it can be launched by one person in adverse conditions.

2.10 The floor of the liferaft shall be waterproof.

2.11 The liferaft shall be inflated by a gas, which is not injurious to the occupants, and inflation shall take place automatically either on the pulling of a line, or by some other equally simple and efficient method. Provision shall be made for maintaining pressure with a topping-up pump or bellows.

2.12 The liferaft shall be of suitable material and construction, and shall be so constructed as to be capable of withstanding exposure for 30 days afloat in all sea conditions.

2.13 Every liferaft which is designed for use with a launching appliance shall be properly constructed for that purpose, and shall be of sufficient strength to permit it to be safely lowered into the water when loaded with its full complement of persons and equipment.

2.14 The liferaft shall be capable of operating through a temperature range of +66°C to 18°C.

### **3. Construction and equipment of open reversible liferafts.**

#### **3.1 General**

3.1.1 All open reversible liferafts should be:

- (a) constructed with proper workmanship and materials,
- (b) not damaged in stowage throughout the air temperature range of -18°C to +65°C;
- (c) capable of operating throughout an air temperature range of -18°C to +65°C, and a seawater temperature range of -1°C to +30°C;
- (d) rot-proof, corrosion-resistant, and not be unduly affected by seawater, oil or fungal attack;
- (e) stable and maintain their shape when inflated and fully laden; and
- (f) fitted with retro-reflective tape not less than 50mm wide around both buoyancy chambers of the liferaft to assist in detection from the sea and from the air.

#### **3.2 Construction**

3.2.1 The open reversible liferaft should be so constructed that when it is dropped into the water in its container from a height of 10m, the liferaft and its equipment will operate satisfactorily. If the open reversible liferaft is to be stowed at a height of more than 10m above the waterline in the lightest seagoing condition, it should be of a type, which has been satisfactorily drop-tested from at least that height.

3.2.2 The open reversible floating liferaft should be capable of withstanding repeated jumps on to it from a height of at least 4.5m.

3.2.3 The open reversible liferaft and its fittings should be so constructed as to enable it to be towed at a speed of 3 knots in calm water when loaded with its full complement of persons and equipment, with the sea anchor deployed.

3.2.4 The open reversible liferaft when fully inflated should be capable of being boarded from the water whichever way up it inflates.

3.2.5 The main buoyancy chamber should be divided into not less than two separate compartments; chambers should be so arranged that in the event of one of the compartments being damaged or failing to inflate, the intact compartment should be able to support, with positive freeboard over the open reversible liferaft's entire periphery, the number of persons which the liferaft is permitted to accommodate, each having a mass of 75kg, and seated in their normal positions.

3.2.6 The floor of the open reversible liferaft should be waterproof.

3.2.7 The open reversible liferaft should be inflated with a non-toxic gas by an inflation system complying with the following requirements:

- (a) the open reversible liferaft shall be capable of being inflated by one person;
- (b) inflation should be completed within the period of one minute at an ambient temperature of between 18°C and 20°C and within a period of three minutes at an ambient temperature of - 18°C; and
- (c) after inflation the open reversible liferaft should maintain its form when loaded with its full complement of persons and equipment.

3.2.8 Each inflatable compartment should be capable of withstanding a pressure equal to at least three times the working pressure and should be prevented from reaching a pressure exceeding twice the working pressure either by means of relief of valves or by a limited gas supply. Means should be provided for fitting the topping-up pump or bellows.

3.2.9 The surface of the buoyancy tubes should be of non-slip material. At least 25% of these tubes should be of a highly visible colour.

### 3.3 Open reversible liferaft fittings

3.3.1 Lifelines should be securely becketed around the inside and outside of the open reversible liferaft.

3.3.2 The open reversible liferaft should be fitted with an efficient painter of a length suitable for automatic inflation on reaching the water. For open reversible liferafts accommodating more than 30 persons an additional bowsing-in line should be fitted.

3.3.3 The breaking strength of the painter system including its means of attachment to the open reversible liferaft, except the weak link, should be not less than:

- (a) 7.5 kN for open reversible liferafts accommodating up to 8 persons;
- (b) 10.0 kN for open reversible liferafts accommodating 9 to 30 persons; and
- (c) 15.0 kN for open reversible liferafts accommodating more than 30 persons.

3.3.4 The weak link shall not be broken by the force required to pull the painter from the life-raft container, shall be of sufficient strength to permit the inflation of the liferaft, and shall break under a strain of  $2.2 \pm 0.4$  kN.

3.3.5 The open reversible liferaft should be fitted with at least the following number of inflated ramps to assist boarding from the sea whichever way up the raft inflates:

- (a) one boarding ramp for open reversible liferafts accommodating up to 30 persons; or
- (b) two boarding ramps for open reversible liferafts accommodating more than 30 persons, such boarding ramps should be 180° apart.

3.3.6 The open reversible liferaft should be fitted with water pockets complying with the following requirements:

- (a) the cross-sectional area of the pockets should be in the shape of an isosceles triangle the following requirements:
- (b) the cross-sectional area of the pockets should be in the shape of an isosceles triangle with the base of the triangle attached to the buoyancy tubes of the open reversible liferaft;
- (c) the design should be such that the pockets fill to approximately 60 per cent of capacity within 15 to 25 seconds of deployment;
- (d) the pockets attached to each buoyancy tube should normally have aggregate capacity of between 125 litres and 150 litres for inflatable open reversible liferafts up to and including the 10 person size;
- (e) the pockets to be fitted to each buoyancy tube on liferafts certified to carry more than 10 persons should have as far as practicable an aggregate capacity of  $(12 \times N)$  litres, where  $N$  is the number of persons carried;
- (f) each pocket on a buoyancy tube should be attached so that when the pocket is in the deployed position it is attached along the full length of its upper edges to, or close to, the lowest part of the lower buoyancy tube; and
- (g) the pockets should be distributed symmetrically round the circumference of the liferaft with sufficient separation between each pocket to enable air to escape readily.

3.3.7 At least one manually controlled lamp complying with the requirements should be fitted on the upper and lower surfaces of the buoyancy tubes.

3.3.8 One automatic draining arrangement should be provided on each side of the floor of the liferaft in an open reversible liferafts accommodating more than 30 persons.

3.3.9 Where appropriate the equipment required by Schedule XVIII should be stowed in a container which, if it is not an integral part of, or permanently attached to, the open reversible liferaft, should be stowed and secured to the open reversible liferaft and be capable of floating in water for at least 30 minutes without damage to its contents. Irrespective of whether the equipment container is an integral part of, or is permanently attached to, the open reversible liferaft, the equipment should be readily accessible irrespective of which way up the open reversible liferaft inflates. The line which secures the equipment container to the open reversible liferaft should have a breaking strength of 2 kN or a breaking strain of 3:1 based on the mass of the complete equipment pack, whichever is the greater.

### 3.4 *Containers for open reversible inflatable liferafts*

3.4.1 The open reversible liferafts should be packed in a container that is so constructed as to withstand conditions encountered at sea and of sufficient inherent buoyancy, when packed with the liferaft and its equipment, to pull the painter from within and to operate the inflation mechanism should the craft sink. The container should as far as practicable be watertight, except for drain holes in the container bottom.

3.4.2 The container should be marked with:

- (a) maker's name or trademark;
- (b) serial number;
- (c) number of persons it is permitted to carry;
- (d) the words "non-SOLAS reversible";
- (e) type of emergency pack enclosed;
- (f) date when last serviced;
- (g) length of painter
- (h) maximum permitted height of stowage above waterline (depending on drop-test height); and
- (i) launching instructions.

### 3.5 *Markings on open reversible inflatable liferafts*

3.5.1 Open reversible liferafts should be marked with:

- (a) maker's name or trademark;
- (b) serial number;
- (c) date of manufacture (month and year);
- (d) name and place of service station where it was last serviced; and
- (e) number of persons it is permitted to accommodate on the top of each buoyancy tube in characters not less than 100mm in height and of a colour contrasting with that of the tube.

### 3.6 *Instructions and Information*

3.6.1 Instructions and information required for inclusion in the craft's training manual and in the instructions for on-board maintenance should be in a form suitable for inclusion in such training manual and instructions for on-board maintenance. Instructions and information should be in English in a clear and concise form and should include, as appropriate, the following:

- (a) general description of the open reversible liferaft and its equipment;
- (b) installation arrangements;
- (c) operational instructions including use of associated survival equipment; and
- (d) servicing requirements.

#### 4 *Liferaft capacity*

4.1 The number of persons which a rigid coastal liferaft shall be permitted to accommodate shall be equal to the lesser of:

4.1.1 the greatest whole number obtained by dividing by 0.096 the volume, measured in  $m^3$  of the liferaft less the mass of the liferaft in tonnes; or

4.1.2 the greatest whole number obtained by dividing by 0.372 the surface area of the rigid coastal liferaft deck measured in  $m^2$ ; or

4.1.3 the number of persons having an average mass of 75kg, all wearing lifejackets, that can be seated inboard of the buoyancy tubes without interfering with the operation of any of the liferafts equipment.

4.2 The number of persons which an inflatable coastal liferaft shall be permitted to accommodate shall be equal to the lesser of:

4.2.1 the greatest whole number obtained by dividing by 0.096 the volume, measured in  $m^3$  of the main buoyancy tubes (which for this purpose should not include the thwarts if fitted) when inflated; or

4.2.2 the greatest whole number obtained by dividing by 0.372 the inner horizontal cross-sectional area of the open reversible liferaft measured in  $m^2$  (which for this purpose may include the thwart or thwarts, if fitted) measured to the innermost edge of the buoyancy tubes; or

4.2.3 the number of persons averaging 75 kg, all wearing lifejackets, that can be seated in the raft without interfering with the operation of any of the liferafts equipment; provided that

4.2.4 The carrying capacity of an inflatable coastal liferaft shall not be less than 4 persons.

4.3 The number of persons which an open reversible liferaft shall be permitted to accommodate shall be equal to the lesser of;

4.3.1 the greatest whole number obtained by dividing by 0.096 the volume, measured in  $m^3$  of the main buoyancy tubes (which for this purpose should not include the thwarts if fitted) when inflated; or

4.3.2 the greatest whole number obtained by dividing by 0.372 the inner horizontal cross-sectional area of the open reversible liferaft measured in  $m^2$  (which for this purpose may include the thwart or thwarts, if fitted) measured to the innermost edge of the buoyancy tubes; or

4.3.3 the number of persons having an average mass of 75kg, all wearing lifejackets, that can be seated inboard of the buoyancy tubes without interfering with the operation of any of the liferafts equipment.

SCHEDULE XIII  
(REGULATION 92(2))

REQUIREMENTS FOR COASTAL LIFEBOATS

1 Construction of lifeboats

1.1 Every coastal lifeboat shall be an open boat constructed with rigid sides.

1.2 The boat shall be of such form and proportions that it shall have ample stability in a seaway and sufficient freeboard when loaded with its equipment and the number of persons specified in Table 1.3.

1.3 The length of the boat and the number of persons for whom seating shall be provided in the boat shall be determined in accordance with the following table:

Number of persons on board the vessel	Minimum length of boat in metres	Minimum seating capacity of boat (persons)
9	4.75	9
8	4.50	8
6 or 7	4.25	7
4 or 5	4.00	5
3	3.75	3
2	3.25	2

Table: Lifeboat size and seating capacity

1.4 All thwart and side seats in the boat shall be fitted as low in the boat as practicable and bottom boards shall be fitted.

1.5 The boat shall be square sterned and shall have a mean sheer at least equal to five per cent of its length.

1.6 The boat shall be fitted with internal buoyancy appliances, which shall be so placed as to secure stability, when the boat is fully laden under adverse weather conditions.

1.7 Every boat shall be fitted with internal buoyancy appliances, which shall consist either of air cases or of buoyant material.

1.8 The total volume of the internal buoyancy appliances shall be such that it will be at least equal to the sum of the volumes of:

1.8.1 that required to float the boat and its full equipment when the boat is flooded and open to the sea so that the top of the gunwale amidships is not submerged; and

1.8.2 that equal to 7.5 per cent of the cubic capacity of the boat, determined as set out in 2 below.

## 2 Cubic Capacity of Lifeboats

2.1 Subject to the provisions of 2.6 the cubic of a lifeboat for the purposes of this Schedule shall be measured in cubic metres and shall be determined by the formula;

$$\text{Cubic Capacity} = L \times (4A + 2B + 4C)$$

Where L denotes the length of the boat in metres from the inside of the planking or plating of the stern to the corresponding point at the stem post or, in the case of a boat with a square stem, to the inside of the transom; and

A, B and C denote, respectively, the areas of the cross-sections at the quarter length forward, amidships, and the quarter length aft, which correspond to the three points obtained by dividing L into four equal parts (for this purpose the areas corresponding to the two ends of the boat being considered negligible)

2.2 For the purpose of 2.1, the areas A, B and C shall be deemed to be given in square metres by the successive application of the following formula to each of the three cross-sections:

$$\text{Area} = h(a + 4b + 2c + 4d + e)$$

Where h denotes: the depth measured in metres inside the planking or plating from the keel to the level of the gunwale; or the depth ascertained in accordance with 1.9.4 and 1.9.5, as the case requires; and

a, b, c, d and e denote the horizontal breadths of the boat measured in metres inside the planking or plating at the upper and lower points of the depth and at the three points obtained by dividing h into four equal parts (a and e being the breadths at the extreme points, and c at the middle point of h).

2.3 For the purpose of this Schedule the capacity of a square-sterned boat shall be calculated as if the boat had a pointed stern.

2.4 If the sheer of the gunwale, measured at the two points situated at a quarter of the length of the boat from the ends, exceeds one per cent of the length of the boat, the depth employed in calculating the area A or C shall be deemed to be the depth amidships plus one per cent of the length of the lifeboat.

2.5 If the depth of the boat amidships exceeds forty-five per cent of the breadth, the depth employed in calculating the area of the amidships cross-section B shall be deemed to be equal to forty-five per cent of the breadth, and the depth employed in calculating the area A or C is obtained by increasing this last figure by an amount equal to one per cent of the length of the boat, but so that in no case shall the depth employed in the calculation exceed the actual depth at area A or C, as the case may be.



2.6 Unless the owner of a lifeboat constructed by wooden planks requires the cubic capacity to be determined by exact measurement, the cubic capacity of such a boat may be assumed for the purposes of this item to be the product of the length, the breadth and the depth multiplied by 0.6 as long as this formula does not give a greater capacity than that obtained by the formula set out in 2.1.

2.7 The dimensions for the purposes of 2.6 shall be measured in the following manner:

Length - from the intersection of the outside of the planking with the stem to the corresponding point at the stern post, or in the case of a square-sterned boat, to the after side of the transom;

Breadth - from the outside of the planking at the point where the breadth of the boat is greatest; and

Depth - amidships inside the planking from the keel to the level of the gun wale.

2.8 For the purposes of 2.6 the depth measurement used in calculating the cubic capacity shall, where it exceeds forty-five per cent of the breadth, be deemed to be equal to forty-five per cent of the breadth.

2.9 For the purposes of this Schedule the cubic capacity of a mechanically propelled lifeboat or a motor lifeboat is the cubic capacity obtained in accordance with the preceding provisions of this Schedule after deducting from the gross capacity a volume equal to that occupied by the motor and its accessories or the propelling gear and gearbox as the case may be, and, when carried, the searchlight and radio-telegraphy equipment and their accessories.

### **3. Construction of coastal motor lifeboats and coastal mechanically-propelled lifeboats**

3.1 A motor lifeboat shall comply with the following requirements:

3.1.1 the lifeboat shall be equipped with a compression ignition engine that shall be kept at all times ready for use;

3.1.2 the engine shall be capable of being started under all conditions;

3.1.3 the engine shall operate properly under all conditions including at least 10° list and 10° trim;

3.1.4 the circulating water pumps shall be self-priming;

3.1.5 the engine and its accessories, including the fuel tank, pipes and fittings, shall be adequately protected to ensure reliable operation under conditions likely to arise at sea during heavy weather;

- 3.1.6 where the lifeboat is made of wood, a metal tray shall be fitted under the engine;
- 3.1.7 no part of the fuel tank or its fittings shall depend on soft solder for tightness;
- 3.1.8 if the fuel tank is made of steel, it shall be galvanised externally;
- 3.1.9 the fuel tank shall be substantially constructed and together with its connexions shall be capable of withstanding hydraulic pressure corresponding to a head of at least 4.5m of fresh water,
- 3.1.10 the fuel tank shall be securely fixed in position and be fitted with suitable filling and relief arrangements;
- 3.1.11 a metal tray shall be fitted under the fuel tank;
- 3.1.12 the engine shall be covered in and the casing shall be of steel or shall be fire-proofed;
- 3.1.13 the engine and fuel tank spaces shall be efficiently ventilated;
- 3.1.14 the shafting and other moving parts of the engine shall be fenced where necessary to protect the persons in the lifeboat from injury;
- 3.1.15 the speed ahead shall not be less than four knots in smooth water when the lifeboat is loaded with its full complement of persons and equipment;
- 3.1.16 fuel shall be provided sufficient for twenty-four hours continuous operation at four knots;
- 3.1.17 the engine shall provide sufficient power for going astern; and
- 3.1.18 the engine shall be fitted with a generator capable of re-charging all the batteries in the lifeboat.
- 3.2 A mechanically propelled lifeboat shall comply with the following requirements:
  - 3.2.1 the lifeboat shall be propelled by an approved mechanical gear.
  - 3.2.2 the mechanical propelling gear shall be so arranged that it can rapidly and easily be made ready for service and will not interfere with the rapid embarkation of persons;

3.2.3 if manually operated, the mechanical propelling gear shall be capable of being operated by a person untrained in its use;

3.2.4 the mechanical propelling gear shall be capable of being operated when the lifeboat is flooded;

3.2.5 the mechanical propelling gear shall be effective in propelling the lifeboat ahead and astern when the lifeboat is partially or fully loaded;

3.2.6 the mechanical propelling gear shall be fitted with a device enabling the helmsman at the time to cause the lifeboat to go astern whilst the propelling gear is in operation;

3.2.7 the mechanical propelling gear shall be of sufficient power to enable the lifeboat to be propelled at a speed ahead of three and one-half knots over a distance of one-quarter of a nautical mile in smooth water, and to hold course under adverse weather conditions;

3.2.8 the mechanical propelling gear shall be capable of being operated, without adjustment, by persons of different stature; and

3.2.9 the mechanical propelling gear shall be substantially constructed and fitted to the lifeboat in an efficient manner.

#### SCHEDULE XIV (REGULATION 92(2))

##### BUOYANT APPLIANCES

###### 1 Construction

1.1. A buoyant appliance shall be manufactured from suitably encased buoyant material having the properties detailed in 1.2 of Schedule XII.

1.2 The encasing material shall be a material which:

1.2.1 retains its shape and strength when subject to the range of temperature which may be encountered in service and is durable in sea water,

1.2.2 protects the buoyancy material from ultra violet light and physical damage;

1.2.3 is fire retardant or painted with a fire retarding paint.

1.3 A buoyant appliance shall be capable of withstanding a drop test, the height of which shall be equivalent to that of the deck on which it is stowed above the vessel's light water line but in no case shall be less than 6m.

1.4 A buoyant appliance shall be effective and stable when floating either way up and shall not require adjustment before use.

1.5 Grab lines shall be fitted all round the appliance. The grab lines shall be secured to the appliance at not more than 460mm centres or less than 300mm centres and interlaced to prevent movement. Each loop shall have a float and the depth of the loop when wet shall be not less than 150mm and not more than 200mm. The grab lines shall be of rope not less than 7mm in diameter. The fastenings securing the grab lines to the appliance shall be strong enough to permit the appliance being lifted by the grab lines.

1.6 A buoyant appliance shall be coloured a highly visible colour.

1.7 A buoyant appliance shall not exceed 180kg in mass unless suitable means are provided to enable it to be launched and, where the appliance exceeds 136kg in mass but does not exceed 180kg in mass, suitable handles or rings shall be fitted to enable it to be launched by hand.

1.8 The buoyant appliance shall be fitted with retro-reflective tape not less than 50 millimeters wide to assist in detection from the sea and from the air.

## **2 Capacity**

2.1 The number of persons that the appliance shall be deemed fit to support shall be equal to the lesser of the number of grab line loops and the greatest whole number obtained from multiplying by 70 the difference between the volume of the appliance in cubic metres and the mass of the appliance in tonnes.

### **SCHEDULE XV (REGULATION 92(2))**

#### **NON-SOLAS RESCUE BOAT**

1 A non-SOLAS rescue boat shall comply with the following requirements:

1.1 it shall be of a length of 3.25m and above and constructed of any suitable material;

1.2 it shall be fitted with a suitable motor for the purpose of marshalling non-powered lifesaving appliances;

1.3 it shall be of such form and proportions as to have ample stability and sufficient freeboard in a seaway when loaded with its full complement of personnel and equipment;

1.4 it shall be of sufficient strength and rigidity to enable it to be lowered and recovered with its full complement of personnel and equipment;

1.5 if it is an inflatable boat it shall be provided with a suitable cover, be inflated at all times and be fitted with its motor.

2 The equipment of a non-SOLAS rescue boat shall include:

2.1 a waterproof electric torch

2.2 a bucket fitted with a lanyard

2.3 oars or paddles

2.4 grablines; and

2.5 a heaving line with a rescue quoit.

3 Adequate means shall be provided for launching and recovering the non-SOLAS rescue boat when loaded with two persons each of 75kg mass, full equipment and engine.

#### SCHEDULE XVI (REGULATION 94(1))

##### HAND-HELD DISTRESS FLARES AND SMOKE SIGNALS

###### 1 Hand held Red Distress Flare Signal

1.1 A hand held red distress flare signal shall be designed so that it can be operated at sea from a small boat or liferaft, under adverse conditions in darkness with wet, cold or gloved hands and without causing discomfort to the uncovered hands of the operator. The method of operation shall be self-evident. Protective caps shall be securely fitted and tear off tapes, where used, protrude sufficiently to facilitate removal. Sealing shall not depend on adhesive tapes.

1.2 A hand held red distress flare signal shall be so constructed that the end from which the light is emitted can be positively identified by day or night.

1.3 A hand held red distress flare signal shall be provided with an integral or permanently attached means of ignition designed to be operated from a hand held position without external aid and without injury to the operator or any person nearby

1.4 A hand held red distress flare signal shall be capable of functioning and meeting the performance criteria detailed in 1.5 and 1.6 after:

1.4.1 immersion, with all packaging intact, under a head of water of 1m for 24 hours;

1.4.2 immersion, with the outer packaging and tapes (if any) removed, but with the protective caps on, under a head of water of 1m for 2 hours;

1.4.3 immersion, in the ready to fire condition, under a head of water of 1mm for 60 seconds; and

1.4.4 immersion, after ignition, under a head of water of 100mm for 10 seconds.

1.5 A hand held red distress flare signal shall be capable of emitting a red light with a minimum intensity of 15000 candela for not less than 60 seconds.

1.6 A hand held red distress flare signal shall be so constructed that, when fired, no burning composition will fall from the signal which might cause damage to an inflated liferaft.

1.7 A hand held red distress flare signal shall be so constructed that all metal components shall be corrosion resistant and all components, compositions and ingredients shall be of a character and quality so that the signal shall remain serviceable under magazine storage condition for at least 4 years and under reasonable conditions in a marine environment for at least 3 years.

1.8 A hand held red distress flare signal shall be so constructed that neither the composition nor the decomposition products of a signal shall include highly toxic products.

1.9 A hand held red distress flare signal shall be legibly and permanently marked with:

- the identification of the type of signal;
- the name of the manufacturer;
- the manufacturer's date of issue;
- the date of expiry of the signal;
- the manufacturer's lot or batch number.

1.10 A hand held red distress flare signal shall be marked with clear and concise directions for use in the English language and shall include illustrations as to use.

## 2. Hand held Orange Smoke Signal

2.1 A hand held orange smoke signal shall be designed so that it can be operated at sea from a small boat or liferaft, under adverse conditions in darkness with wet, cold or gloved hands and without causing discomfort to the uncovered hands of the operator. The method of operation shall be self-evident. Protective caps shall be securely fitted and tear off tapes, where used, shall protrude sufficiently to facilitate removal. Sealing shall not depend on adhesive tapes.

2.2 A hand held orange smoke signal shall be so constructed that the end from which the smoke is emitted can be positively identified by day or night.

2.3 A hand held orange smoke signal shall be provided with an integral or permanently attached means of ignition designed to be operated from a hand held position without external aid and without injury to the operator or any person nearby.

2.4 A hand held orange smoke signal shall be capable of functioning and meeting the performance criteria detailed in 2.5 and 2.6 after:

2.4.1 immersion, with all packaging intact, under a head of water of 1m for 24 hours.

2.4.2 immersion, with the outer packaging and tapes (if any) removed but with the protective caps on under a head of water of 1m for 2 hours;

2.4.3 immersion, in the ready to fire condition, under a head of water of 100mm for 60 seconds; and

2.4.4 immersion, after ignition, under a head of water of 100mm for 10 seconds.

2.5 A hand held orange smoke signal shall emit a vivid and expanding cloud of dense, orange coloured smoke which shall be clearly visible for a distance of at least 4km for at least 60 seconds under conditions of good visibility and wind speed of 5 to 10km/hour.

2.6 A hand held orange smoke signal shall be so constructed that when fired, no burning composition will fall from the signal, which might cause damage to an inflated liferaft.

2.7 A hand held orange smoke signal shall be so constructed that all metal components shall be corrosion resistant and all components, compositions and ingredients shall be of a character and quality so that the signal shall remain serviceable under magazine storage condition for at least 4 years, and under reasonable conditions in a marine environment for at least 3 years.

- 2.8 A hand held orange smoke signal shall be so constructed that neither the composition nor the decomposition products of a signal shall include highly toxic products.
- 2.9 A hand held orange smoke signal shall be legibly and permanently marked with
- the identification of the type of signal;
  - the name of the manufacturer;
  - the manufacturer's date of issue;
  - the date of expiry of the signal; and
  - the manufacturer's lot or batch number.
- 2.10 A hand held orange smoke signal shall be marked with clear and concise directions for use in the English language and shall include illustrations as to use.

**SCHEDULE XVII**  
**(REGULATION 97 (2)(C))**

**GUIDANCE TO ADMINISTRATIONS REGARDING THE PROVISION OF  
LIFE-SAVING APPLIANCES**

1 In lieu of compliance with the provisions of regulation 97 of the Regulations Administration may permit vessels on Near-Coastal or Inshore voyages to carry one or more coastal survival craft complying with the requirements of Schedules XII and XIII as appropriate, as follows:

1.1 a vessel of 25m and above in length operating in Near-Coastal sea areas may carry a coastal lifeboat or coastal lifeboats complying with Schedule XIII having such aggregate capacity as will accommodate the total number of persons on board; or

1.2 a vessel of 25m and above in length operating in Near-Coastal sea areas may carry a coastal liferafts or liferafts complying with Schedule XII plus a rescue boat complying with Schedule XV of such aggregate capacity as will accommodate the total number of persons on board;

1.3 a vessel of less than 25m in length operating in Near-Coastal sea areas may carry a coastal liferaft or coastal liferafts complying with Schedule XIII of such aggregate capacity as will accommodate the total number of persons on board;

1.4 a vessel operating in Inshore sea areas may carry sufficient buoyant appliances complying with Schedule XV and/or lifebuoys to provide for the total number of persons on board assuming that each lifebuoy provides support for two persons. If the vessels are of 25m and above in length it shall also carry a dinghy, the capacity of which may be included in the total capacity. In a vessel of less than 25m in length that carries a dinghy the capacity of the dinghy may be included in the total capacity.



2. Administrations may permit the following substitutions in place of the provisions of 1:

2.1 buoyant appliances to be replaced by open reversible liferafts of equal aggregate capacity.

2.2 coastal liferafts to be replaced by open reversible liferafts on specified voyages where the Administration considers that, in view of proximity to rescue facilities and suitable prevailing weather conditions, the safety of survivors will not be adversely affected by the substitution.

2.3 fast rescue boats to be used in lieu of rescue boats.

3 In approving open reversible liferafts as an equivalent to buoyant appliances or coastal liferafts under 3.1 or 3.2, an Administration may allow a capacity for open reversible liferafts for specific voyages in Near-Coastal or Inshore sea areas, of not more than 30 per cent greater than that specified in 4.3 of Schedule XII.

#### SCHEDULE XVIII (REGULATION 97(4))

##### EQUIPMENT AND SUPPLIES IN LIFEBOATS AND LIFERAFTS

##### 1 First-aid outfit to be provided in every lifeboat and liferaft

- 1.1 two standard dressings measuring 150mm by 100mm;
- 1.2 two standard dressings measuring 150mm by 200mm;
- 1.3 three triangular woven bandages with approximately 1m sides;
- 1.4 two open weave bandages, measuring 5m by 75mm;
- 1.5 self-adhesive waterproof wound dressing measuring 1m x 60mm;
- 1.6 one packet, containing not less than 10 paraffin gauze dressings for burns, individually wrapped, measuring 100mm by 100mm (approximately);
- 1.7 two tubes of Cetrimide Cream 0.5% 50g (or equivalent antiseptic cream);
- 1.8 fifty Paracetamol tablets 500mg (or equivalent analgesic tablets);
- 1.9 one pair of rustless, stainless metal scissors measuring 100mm with one sharp and one blunt point;
- 1.10 twelve rustless, stainless metal safety pins (various sizes);
- 1.11 one small packet of silica gel (drying agent); and
- 1.12 approved instructions for use of the first-aid outfit printed on linen or water proof paper in the English language.

## **2 Equipment and rations to be provided in every coastal lifeboat**

- 2.1 A single complement of buoyant oars and one spare buoyant oar provided that there shall never be less than three oars together with one set of crutches
- 2.2 one boat hook,
- 2.3 two plugs for each plughole (except where effective automatic valves are fitted) attached to the boat by lanyards or chains; a bailer and a bucket;
- 2.4 one rudder attached to the boat and a tiller,
- 2.5 one first aid outfit as specified in 1;
- 2.6 one buoyant container, conspicuously marked as such, suitable for the stowage of small items of equipment identified in this Schedule and which may be stowed in a suitable position in the vessel at the discretion of the Administration;
- 2.7 one painter of sufficient length and size secured to the forward end of the boat with strop and toggle so that it can be released;
- 2.8 means to enable persons to cling to the boat if upturned; one spare set of batteries and one spare bulb in a waterproof container;
- 2.9 one light, buoyant heaving line;
- 2.10 one litre of fresh water for each person in the carrying capacity of the lifeboat;
- 2.11 two red hand held flares and one hand held orange smoke signal complying with the requirements of Schedule XVI;
- 2.12 one copy of the rescue signal table used by life-saving stations, marine rescue units and vessels and persons in distress;
- 2.13 retro-reflective tapes of an approved type (each tape being not less than 300mm long and not less than 50mm wide), fitted on top of the gunwale of the lifeboat and on the outside of the lifeboat as near to the gunwale as possible and spaced so that the distance between the centre of a tape and the centre of the tape next in line is not greater than 500mm;
- 2.14 500grams of barley sugar per person, providing at least 1500 kilojoules in each 100 grams, being barley sugar that has been in the liferaft for a period not exceeding four years, or an approved food ration providing at least 10000 kilojoules per person, being a food ration that has not passed the manufacturer's replacement date or the approved storage life;
- 2.15 six sea-sickness tablets, each containing 300 microgrammes of Hyoscine or equivalent, for each person included in the carrying capacity of the liferaft;
- 2.16 one fishing line and six hooks;
- 2.17 one daylight-signalling mirror;
- 2.18 a watertight container being furnished with a water-proof match striker as part of or attached to the container, and holding not less than 25 matches of a type that is not readily extinguishable by wind; and
- 2.19 six chemiluminescent lights of an approved type.

### 3 Equipment and rations to be provided in every liferaft

- 3.1 one sponge for each person included in the carrying capacity of the liferaft;
- 3.2 two paddles;
- 3.3 where the carrying capacity of a liferaft is thirteen persons or more, two bailers and two safety knives, otherwise one bailer and one safety knife;
- 3.4 one repair outfit capable of repairing punctures in buoyancy compartments;
- 3.5 one topping-up pump or bellows;
- 3.6 one waterproof electric torch suitable for Morse signalling together with or spare set of batteries and one spare bulb in a waterproof container,
- 3.7 one sea-anchor, permanently attached to the liferaft,
- 3.8 one litre of fresh water for each person included in the carrying capacity of the liferaft, to be contained in watertight and rustproof receptacles;
- 3.9 one safety tin-opener,
- 3.10 two hand held flares and one hand held smoke signal complying with the requirements of Schedule XVI;
- 3.11 one first aid outfit as specified in 1;
- 3.12 one copy of the rescue signal table used by life-saving stations, marine rescue units and vessels and persons in distress;
- 3.13 500grams of barley sugar per person, providing at least 1500 kilojoules in each 100 grams, being barley sugar that has been in the liferaft for a period not exceeding four years, or an approved food ration providing at least 10000 kilojoules per person, being a food ration that has not passed the manufacturer's replacement date or the approved storage life;
- 3.14 six sea-sickness tablets, each containing 300 microgrammes of Hyoscine or equivalent, for each person included in the carrying capacity of the liferaft;
- 3.15 one fishing line and six hooks;
- 3.16 one daylight-signalling mirror;
- 3.17 one watertight container being furnished with a water-proof match-striker as part of, or attached to the container, and holding not less than 25 matches of a type that is not readily extinguishable by wind;
- 3.18 six chemiluminescent lights of an approved type;

### 4 Equipment and rations required to be provided in open reversible liferafts

- 4.1 Where an open reversible liferaft is not provided in lieu of a buoyant appliance or coastal liferaft, the equipment, designated as an HSC pack, should consist of:
  - 4.1.1 one buoyant rescue quoit, attached to not less than 30m of buoyant line with a breaking strength of at least 1 kN;
  - 4.1.2 two safety knives of the non-folding type having a buoyant handle, which should be fitted, attached to open reversible liferaft by light lines. They should be stowed in pockets so that, irrespective of the way in which the open reversible liferaft inflates, one will be readily available on the top surface of the upper buoyancy tube in a suitable position to enable the painter to be readily cut;

- 4.1.3 one buoyant bailer;
- 4.1.4 two sponges;
- 4.1.5 one sea anchor permanently attached to the open reversible liferaft in such way as to be readily deployable when the open reversible liferaft inflates. The position of the sea anchor should be clearly marked on both buoyancy tubes;
- 4.1.6 two buoyant paddles;
- 4.1.7 one first-aid outfit in a waterproof case capable of being closed tightly after use;
- 4.1.8 one whistle or equivalent sound signal;
- 4.1.9 two hand flares;
- 4.1.10 one waterproof electric torch suitable for Morse signalling together with one spare set of batteries and one spare bulb in a waterproof container;
- 4.1.11 one repair outfit for repairing punctures in buoyancy compartments; and
- 4.1.12 one topping-up pump or bellows.

4.2 Where an open reversible liferaft is provided in lieu of a coastal liferaft or buoyant appliance, the equipment shall consist of:

4.2.1 for an open reversible liferaft, which is provided in lieu of a coastal liferaft the equipment listed in ~~7.4.1.1~~ 4.1.1 to ~~7.4.1.18~~ 4.1.18 inclusive, except that there shall be in addition:

- (a) one buoyant rescue quoit, attached to not less than 30m of buoyant line with a breaking strength of at least 1kN; and
- (b) the first aid outfit and the sea-sickness tablets shall be enclosed in waterproof cases capable of being tightly closed after use.

4.2.2 for an open reversible liferaft which is provided in lieu of a buoyant appliance:

- (a) one repair outfit for repairing punctures in buoyancy compartments
- (b) one topping-up pump or bellows
- (c) two safety knives of the non-folding type having a buoyant handle, which should be fitted attached to open reversible liferaft by light lines. They should be stowed in pockets so that, irrespective of the way in which the open reversible liferaft inflates, one will be readily available on the top surface of the upper buoyancy tube in a suitable position to enable the painter to be readily cut; and
- (d) one buoyant rescue quoit, attached to not less than 30m of buoyant line with a breaking strength of at least 1kN.

SCHEDULE XIX  
(REGULATION)

REQUIREMENTS FOR WHEELHOUSE AND DECKHOUSE WINDOWS

- 1 Wheelhouse windows should be so located as to afford, where practicable, all round visibility.
- 2 The maximum size of windows to be fitted in wheelhouses and deckhouses of seagoing vessels should not exceed 0.6m<sup>2</sup> and the longer dimension shall not exceed twice the shorter dimension unless it is demonstrated to the Administration that an equivalent level of safety can be achieved by an alternative arrangement.
- 3 Window openings of wheelhouses and deckhouses shall be fitted with laminated or toughened safety glass.
- 4 Wheelhouse window panes shall be of clear glass and plate glass shall not be used.
- 5 Window glasses fitted in rubber or synthetic rubber mouldings are to be provided with continuous internal support against the impact of wind and water.
- 6 The thickness of glass to be used in the windows of wheelhouses and deckhouses of seagoing vessels shall be determined in accordance with 8.
- 7 Vessels which operate solely within the limits of sheltered waters may have windows fitted in accordance with U.8, having a 25 per cent reduction in the design head values given in Table U.2.
- 8 The thickness of the glass is to be determined from the following formula:

$$t = \sqrt{\frac{10BHb^2}{\sigma}}$$

Where:

t = thickness mm

B = non-dimensional coefficient determined from Table U.1.

H = design pressure head in metres determined from Table U.2. and associated notes

b = length in mm of the short dimension of the window

σ = allowable working stress of glass in kPa determined from Table U.3.

- 8.1 The glass thickness obtained from 8 shall not be less than 6mm

9 Deflection of the glass under the assumed loads is determined in accordance with the following formula:

$$d = \frac{10\alpha H b^3}{Et^3}$$

Where:

D is deflection in mm.

$\alpha$  is a non-dimensional coefficient determined from Table 1

H is design pressure head in m determined from Table 2, subject to 9.2

b is length in mm of the short dimension of the window

E is Young's modulus of the material in kPa determined from Table 3

t is thickness of window glass in mm

9.1 the deflection calculated in 9 is not to exceed 0.01 of the span of the short dimension of the pane

9.2 design pressure heads for a vessel having a length greater than 30 metres shall be determined from Appendix E of British Standard MA25: October 1973, Ships' Windows.

10 Window panes of material other than glass shall be specially considered by the Administration.

11 The following points concerning glazing of the windows shall be observed:

11.1 Toughened glass having chipped edges or surface damage shall not be used;

11.2 Sufficient edge clearance shall be allowed and insulation shall be used to prevent direct contact between toughened glass and hard materials. In general the edge clearance should be not less than one half the thickness of the glass;

11.3 Windows are to be mounted using suitable resilient gaskets of neoprene rubber or synthetic compounds;

11.4 The support to be afforded in the frames shall not be less than 1.5 times the thickness of glass.

A/b	1.0	1.2	1.4	1.6	1.8	2.0	3.0	4.0	5.0	>5
B	.2874	.3762	.4530	.5172	.5688	.6102	.7134	.7410	.7476	.751
$\alpha$	.0444	.0616	.0770	.0906	.1017	.1110	.1335	.1400	.1417	.142

Table 1 Values for  $\beta$  and  $\alpha$  for aspect ratio  $\frac{a}{b}$

Where a is the long dimension of window, and  
b = short dimension of window

Length m.	Design head m	Length m.	Design head m.
(m)	(m)	(m)	(m)
5	0.27	18	1.82
6	0.32	19	2.02
7	0.40	20	2.22
8	0.48	21	2.42
9	0.58	22	2.63
10	0.69	23	2.86
11	0.79	24	3.10
12	0.90	25	3.37
13	1.03	26	3.59
14	1.17	27	3.85
15	1.33	28	4.12
16	1.48	29	4.40
17	1.65	30	4.70

**Table 2 Design pressure head for forward-facing in the 1st tier windows**

*Note:*

Design pressure heads for windows in positions other than forward-facing in the 1st tier of superstructure shall be the following percentage of the design heads given in Tabel U.2:

70% for side and after windows in 1st tier deckhouses:

70% for forward windows in 2nd tier deckhouses;

40% for side and after windows for 2nd tier and for windows in 3rd and higher tier deckhouses

Material (kPa)	Allowable Working Stress ( $\sigma$ ) kPa	Young Modulus (E)kPa
Toughened glass	$27.6 \times 10^3$	$69 \times 10^6$
Laminated float glass	$58.0 \times 10^3$	$69 \times 10^6$

**Table 3 Allowable working stress ( $\sigma$ ) and Young's Modulus (E)**

Note: Alternative values for  $\sigma$  and E may be permitted to be used where they are supported by the results of tests conducted at an appropriate testing station.

SCHEDULE XX  
(REGULATION)

HATCHWAY STRENGTH

1 For the purpose of strength calculations it shall be assumed that hatchway covers are subject to the weight of cargo intended to be carried on them or to the following static loads, whichever is the greater:

0.75 tonnes per m<sup>2</sup> for vessels of 18 metres in length or less;

1.0 tonnes per m<sup>2</sup> for vessels of 24 metres in length; and

1.75 tonnes per m<sup>2</sup> for vessels of 100 metres in length and over.

1.1 For intermediate lengths the load values shall be determined by linear interpolation.

1.2 The loads may be reduced to not less than 75 per cent of the above value for covers to hatchways situated on the superstructure deck in a position abaft a p. located 25 per cent of the vessel's length from the forward perpendicular.

2 Where covers are constructed of mild steel the maximum stress calculated according to 1 multiplied by 4.25 shall not exceed the minimum ultimate strength of the material. Under these loads the maximum deflection shall be not more than 0.0028 times the span.

3 The strength and stiffness of covers made of materials other than mild steel shall be equivalent to those of mild steel.

4 Covers shall be fitted with approved clamping devices and gaskets sufficient to ensure weathertightness.

signed at Honiara this twenty-eighth Day of November, 2006

Stanley Sofu  
Minister of Infrastructure and Development