

MARINE ACT, 1986  
(ACT No. 35 OF 1986)

MARINE (FIJI MARITIME CODE) REGULATIONS, 1990

In exercise of the powers conferred upon me by sections 94, 143 and 212 of the Marine Act, 1986, I have made the following Regulations.

*Citations*

- 1.—(1) These Regulations may be cited as the Marine (Fiji Maritime Code) Regulations, 1990.
- (2) The Code set out in the Schedule may be cited as the Fiji Maritime Code.

*Purpose*

- 2.—(1) The purpose of these Regulations is to set out in one document, called the Fiji Maritime Code, details of the law relating to safety of vessels (covered by Part IV of the Marine Act), and to give legal force to those provisions of that Code that do not otherwise have that force by virtue of the Marine Act, 1986 or regulations made under that Act.
- (2) Parts IV and V of the Marine Act, 1986 do not apply to vessels that are less than 10 metres in length (details of the law relating to these vessels are contained in the Fiji Small Craft Code).

*Fiji Maritime Code given force of law*

3. Except to the extent that any provision of the Fiji Maritime Code—
  - (a) has the force of law by virtue of the Marine Act, 1986 or any other regulation made under that Act; or
  - (b) is inconsistent with any provision of the Marine Act, 1986 or any regulation made under that Act,the provisions of the Fiji Maritime Code have the force of law.

*Prescribed surveys and inspections*

- 4.—(1) This regulation applies to vessels—
  - (a) to which Part IV of the Marine Act, No. 1986 applies; and
  - (b) which are registered or which upon completion of construction will be registered; and
  - (c) which are not, or upon completion of construction will not be Safety Convention ships.
- (2) For the purpose of section 62 of the Marine Act, 1986 the prescribed surveys and inspections in respect of a vessel to which this regulation applies are those specified in section 14 of the Fiji Maritime Code.

*Emergency procedures and safety of navigation*

5. A person must not fail to comply with an obligation or duty imposed upon him by virtue of section 15 of the Fiji Maritime Code.

Penalty: A fine not exceeding \$2000.

Dated at Suva this 26th day of July 1990.

A. V. TOR  
Minister for Infrastructure and  
Public Utilities

## SCHEDULE

## THE FIJI MARITIME CODE

*Arrangement of sections*

Section 1	— Introduction, definitions and general requirements
Section 2	— Certificates of Competency
Section 3	— Safety Manning
Section 4	— Mercantile Marine
Section 5	— Construction and stability
Section 6	— Crew accommodation
Section 7	— Load lines
Section 8	— Tonnage measurement
Section 9	— Engineering
Section 10	— Life-saving appliances
Section 11	— Fire appliances
Section 12	— Radio equipment
Section 13	— Miscellaneous equipment
Section 14	— Surveys and Certificates of Survey
Section 15	— Emergency procedures and safety of navigation

## SECTION 1

## INTRODUCTION, DEFINITIONS AND GENERAL REQUIREMENTS

This Section is divided into five Parts as follows:

- Part 1 : Preliminary
- Part 2 : Definitions
- Part 3 : Operational Areas and Classification of Vessels
- Part 4 : General
- Part 5 : Submission of Information

## PART 1—PRELIMINARY

1. For convenience of presentation and application this Code is produced in Sections, each dealing with an appropriate area of control. Each Section shall always be read in conjunction with this Section—“Introduction, Definitions and General Requirements” and such other Section or Sections to which a special reference may be made.

2. These Uniform Requirements shall apply to all new vessels and except when otherwise specified in a Section, to all existing vessels as far as is considered reasonable and practicable by the Fiji Marine Board.

## PART 2—DEFINITIONS

Terms defined in Section 5 of the Marine Act 1986 shall apply in the Uniform Requirements. Although some of the terms are repeated or further clarified in these Uniform Requirements for convenience of reference, the definition in the Act takes preference.

3. The definitions set out in clause 4 of this Section shall have the meaning when used in reference to any Section of these Uniform Requirements unless the contrary intention appears.

4. The following terms shall have the meanings set against them respectively:

*Accommodation Space*—Passenger spaces, corridors, lavatories, cabins, offices, crew spaces, shops, isolated pantries and lockers and similar spaces.

*Approved*—Approved by the Fiji Marine Board.

*“Australian Uniform Shipping Laws Code”*—The Australian Transport Advisory Council Uniform Shipping Laws Code (amended to 1 August 1984) Published by the Australian Government Publishing Service Canberra.

*Authorised*—Authorised by the Fiji Marine Board.

*Authority*—The Fiji Marine Board, unless stated otherwise in the text.

*Approved Society or Authorised Society*—An Approved Classification Society as listed in Appendix II of Section 14.

*Breadth*—The maximum breadth measured amidships

- (i) in the case of a metal hull—to the moulded line of the frame;
- (ii) in the case of any other hull—to the outer surface of the hull.

*Cargo Space*—Spaces appropriated for cargo including trunks leading to such spaces.

**Classed Vessel**—A vessel in respect of which there is in force a Classification Certificate.

**Classification Certificate**—A certificate issued by a Classification Society which records the classification accorded to a vessel by that society.

**Classification Society**—An association approved for the survey of vessels.

**Commercial Vessel**—A Vessel which is not used solely for pleasure or recreation and the use of which is made, allowed or authorised in the course of any business or in connection with any commercial transaction.

**Control Station**—Includes those spaces in which the vessel's radio or main navigating equipment or the emergency source of power is located or where the fire recording or fire control equipment is centralised.

**Crew Accommodation or Crew Space**—In relation to a vessel means such parts of the vessel as are set aside for the exclusive use of the Crew.

**Depth**—The moulded depth measured at the middle of the measured length from the base line to the top of the freeboard deck beams at the side of the vessel.

For the purposes of this definition, the base line is the line projected by the plane forming the top of the keel where a plate keel is fitted. In the case of a timber or composite vessel, the top of the keel shall be read as a reference to the lower edge of the keel rabbet.

In the case of a vessel which has a bar keel or in which the form at the lower part of the midship section is of a hollow character, or thick garboards are fitted, the top of the keel shall be read as a reference to the point where the flat of the bottom continued inward cuts the side of the keel of the vessel.

In each case the plane shall be horizontal when extended transversely.

**Examiner**—A person appointed by the Fiji Marine Board to conduct examinations of the kinds specified by the Fiji Marine Board.

**Existing Vessel**—A vessel which is not a new vessel.

**Fishing Vessel**—A vessel that is, or is, intended to be, used wholly or principally for the catching or taking of Marine Organisms but does not include a vessel that is, or is, intended to be, used wholly or principally—

- (a) in the harvesting or transporting of algae or aquatic plants; or
- (b) as a carrier or mother vessel.

**ISO**—The International Organisation for Standardization,  
1, Rue de Varambe, CH—1211 Geneva, 20, SWITZERLAND.

**Measured Length**—The distance from the fore part of the hull to the after part of the hull, taken at the upperside of the uppermost weathertight deck or, in the case of open vessels, at the height of the gunwale.

**NOTE:**

A clarification of certain terms used in the definition of Measured Length is contained in Appendix A of this Section.

**Master**—A person having command or charge of a vessel, but does not include a pilot.

**Nautical Mile**—The International nautical mile of 1852 metres.

**New Vessel**—A vessel—

- (a) the keel of which was laid or which was at a similar stage of construction;
- or
- (b) that has been substantially—
  - (i) altered; or
  - (ii) reconstructed,
 on or after the coming into force of the applicable provisions.

**Open Vessel**—A vessel which has no weathertight deck for the whole or part of the length of the vessel e.g. a rowing boat with open bottom boards or a half cabin vessel with a cockpit aft fitted with loose deck panels.

**Owner**—In relation to a vessel means any person exercising or discharging or claiming the right or accepting the obligation to exercise or discharge any of the power or duties of an owner whether on his own behalf or on behalf of another and includes a person who is the owner jointly with any other person or persons and the manager or secretary of any body corporate or company.

**Passenger**—A person carried on board with the knowledge or consent of the owner or master of the vessel but does not include—

- (a) a person engaged in any capacity on board the vessel in the business of the vessel; or
- (b) a child under the age of one year.

**Passenger Vessel**—A vessel engaged in International voyages which carries more than twelve passengers.

**Proper Officer**—A person appointed under Section 18 of the Marine Act 1986 to be a proper officer.

**Radio Surveyor**—A person appointed by the Ministry of Information.

**Service Space**—Spaces used for galleys, main pantries, stores (except isolated pantries and lockers), mail and special rooms, workshops other than those forming part of the machinery spaces and trunks to such spaces.

**SOLAS**—In respect of an item or appliance means that the item or appliance shall comply with the requirements of the SAFETY CONVENTION, taking into account the date on which the vessel's keel was laid or was at a similar stage of construction.

**Special Personnel**—All able bodied persons having some knowledge of safety procedures and handling of safety equipment on board who are not directly— or indirectly—paying passengers, carried on board a vessel in connection with the special purpose of the vessel, or because of the need to be on board because of special work being carried out on the vessel, and who are not members of the crew engaged in navigation, engineering or maintenance of the vessel or attached to the vessel to provide services for other persons on board.

**Standards Abbreviations**—

A.S. refers to the Australian Standard.

ASTM refers to the American Standard for Testing Materials.

ALPGA refers to the Australian Liquefied Petroleum Gas Association.

**Superstructure**—A decked structure, including a raised quarter deck, on the freeboard deck extending from side to side of the vessel or with the side plating of the structure not being inboard of the shell plating by more than 4 per cent of the breadth of the vessel.

Where, in pursuance of the above, a lower deck is specified as the freeboard deck of a vessel, any part of the hull which extends above the deck so specified shall be deemed to be a superstructure.

*Surveyor*—A person appointed by the Minister to be a surveyor.

*Tanker*—A cargo vessel constructed or adapted for the carriage of bulk fluid cargoes.

*Tons*—In relation to the grading of vessels means gross tonnage.

*Unclassed Vessel*—A vessel that is not a "Classed Vessel".

*Unmanned Machinery Space*—A decked propulsion machinery space which under normal operating conditions is not occupied or is intermittently occupied.

*Vessel*—Any ship or boat or any other description of vessel used in navigation by water.

### PART 3—OPERATIONAL AREAS AND CLASSIFICATION OF VESSELS

5. *Operational Areas shall apply to appropriate Sections of these Requirements as follows:*

5.1 International Voyage means a voyage—

- (a) from a port or place in Fiji to a port or place outside Fiji;
- (b) from a port or place outside Fiji to a port or place in Fiji; or
- (c) from a port or place outside Fiji to another port or place outside Fiji.

5.2 Pacific Region Trade, in respect of a vessel, means the operation of the vessel within the area delineated by Latitudes 15 degrees North to 47 degrees South and Longitudes 130 degrees East to 130 degrees West.

5.3 Restricted Pacific Trade, in respect of a vessel, means the operation of the vessel on voyages between the island of Rotuma and another port or place in Fiji.

5.4 Fiji Islands Trade, in respect of a vessel, means the operation of the vessel between any two ports or places in Fiji (except Rotuma) beyond the protection of the reefs.

5.5 Seagoing Service, in respect of a vessel, means the operation of the vessel beyond the protection of the reefs, and in respect of seamen, means service on a vessel engaged upon such operations.

5.6 Short Coasting Service, in respect of a vessel, means the operation of the vessel generally within the protection of the land or reefs in the areas specified in Appendix 8, and as may be further restricted in respect of a Certificate of Competency by endorsement on that Certificate.

5.7 Harbours and Rivers Service, in respect of a vessel, means the operation of the vessel entirely within harbour or river limits where the waters are entirely protected and smooth.

6. *Classification of vessels shall apply to all Sections of these Requirements as follows:*

- 6.1 Class 1..... Passenger vessels engaged on International Voyages
- 6.2 Class 2..... Non-Passenger vessels engaged on International Voyages.

- Class 2A..... Non-Passenger vessels of 500 GT and over engaged on International Voyages.
- Class 2B..... Non-Passenger vessels of less than 500 GT engaged on International Voyages.
- 6.3 Class 3..... Vessels other than vessels engaged on International Voyages.
- Class 3A..... Vessels engaged in the Restricted Pacific Trade.
- Class 3B..... Vessels engaged in the Fiji Islands Trade.
- Class 3C..... Vessels engaged in the Sea Going Service.
- Class 3D..... Vessels engaged in the Short Coasting Service.
- Class 3E..... Vessels engaged in the Harbours & Rivers Service.

### 7. *Vessels Limited by Manning.*

7.1 A vessel of any class may be subject to a restricted area of operations if the manning or the qualifications of the personnel are insufficient for the area of operations allowed by its certificate of survey.

### PART 4—GENERAL

#### 8. *Exemption and Equivalent.*

8.1 The Fiji Marine Board may, subject to the principles embodied in these Requirements, exempt a vessel, or vessels included in a specified class of vessel, from the application of any of the provisions of these Requirements to the extent that the Fiji Marine Board is satisfied that compliance with such provision or provisions is unreasonable or impracticable in relation to that vessel or those vessels.

8.2 Where these Requirements provide that a particular fitting, material, appliance or apparatus, or type thereof, shall be fitted or carried in a vessel or that any particular provision shall be made, the Fiji Marine Board may allow any other fitting, material, appliance or apparatus, or type thereof, to be fitted or carried, or any other provision to be made to that vessel, if it is satisfied by trial thereof, or otherwise, that such fitting, material, appliance or apparatus, or type thereof, or provision, is at least as effective as that required by these Requirements.

8.3 The Fiji Marine Board will exercise its power under this clause only after receipt of a written application from the owner of the vessel, or the owner of a vessel in the specified class of vessel, which sets out the grounds of the application and which is supported by such evidence as the Fiji Marine Board may, at or after the time of application, require in order to enable it adequately to investigate the application.

8.4 The Fiji Marine Board may grant an exemption or make an allowance under this clause upon such conditions as it thinks fit.

#### 9. *Requirements not otherwise Specified.*

9.1 Where in case of a vessel provision is not made in these Requirements to cover a specific matter, the Fiji Marine Board may determine what special provisions shall apply to that matter.

### 10. *Sufficiency of Machinery, Equipment and Components.*

10.1 In any respect in which detailed requirements or specifications are not laid down or determined by the Fiji Marine Board for specific items, such items shall be sufficient for the intended service, and conform to good marine practice.

### 11. *Positioning of Equipment.*

11.1 Items of equipment required by these Requirements shall be positioned to the satisfaction of the surveyor.

### 12. *Materials*

12.1. All materials shall be of a good quality conforming to good marine practice and free from defects and when required materials must be covered by test certificates issued by an approved authority or Standards Institute. The cost of any tests required for the materials shall be borne by the owner.

### 13. *Workmanship*

13.1 Manufacture and construction shall conform to good marine practice. The Fiji Marine Board may require any item not in accordance with the approved plans and specifications, or any material, workmanship, or arrangement that is deficient to be rectified.

## PART 5—SUBMISSION OF INFORMATION

### 14. *Preliminary Information, Plans and Specifications to be Submitted.*

14.1 When a vessel is to be built or an existing vessel is to be purchased or substantially altered and any doubt exists as to whether these Requirements shall apply or which certificates will be required, the office of the Fiji Marine Board should be contacted, by the owner or intending owner, as soon as possible. The basic information necessary for initial assessment by the Fiji Marine Board is as follows:

- (a) Vessel Identification, e.g. name or construction number if any;
- (b) Name of owner or intending owner;
- (c) Hull construction material;
- (d) Principal dimensions of vessel;
- (e) Nature of the service in which the vessel will be engaged;
- (f) Intended area of operations of the vessel;
- (g) Gross tonnage(s) or estimated lower and upper limits of gross tonnage(s);
- (h) Whether the vessel is to be classed or is classed and if so the name of the Classification Society and details of the Classification;
- (i) Whether the vessel will hold or holds a Load Line Certificate and/or Cargo Ship Safety Construction Certificate issued by a Classification Society; and
- (j) Whether the vessel, being an existing vessel, holds any other certificates relating to survey and if so the type of each certificate, its date of expiry and the name of the authority who issued the certificate.

14.2 When a vessel is to be built or an existing vessel is to be purchased, chartered or substantially altered for operations within the jurisdiction of the Fiji Marine Board the owner, or intending owner, shall conform with the requirements of

the Survey and Certificates of Survey Section and, to ensure that the requirements of other appropriate Sections relating to the construction, equipment and outfitting of that vessel shall be met, submit appropriate information, plans and data to the Fiji Marine Board for assessment and approval.

14.2.1. The information submitted shall be in accordance with the following:

- (a) Information must be sufficient in detail to ensure that all the relevant requirements have been incorporated in the design. Extraneous and irrelevant information should be omitted where practicable. Written material shall be submitted in the English language.
- (b) Where any doubt exists, as to the information required to be submitted, clarification should be sought from the Fiji Marine Board.
- (c) Print outs should be clear, easy to read and properly identified.
- (d) The number of copies submitted shall be sufficient to permit the retention of two by the Fiji Marine Board.
- (e) Where a design is amended, subsequent to the initial submission, every plan, specification, etc. affected by the alteration, shall be amended accordingly and the date of amendment recorded. As necessary revised copies shall be forwarded immediately to the Fiji Marine Board.
- (f) Drawings and plans should be submitted according to one or more of the following scales: 1:1, 1:2, 1:5, or multiples of 10 thereof.

14.2.2. The extent of the information to be submitted will be dependent on classification and size of the vessel. The following may be used as a general guide:

- (a) all the information nominated in sub-clause 14.1 unless such information has previously been submitted in accordance with that sub-clause;
- (b) the general arrangement plans;
- (c) the construction plans, including transverse and longitudinal section;
- (d) the lines plan;
- (e) plans, specifications or data sheets to cover:
  - (i) the scantlings of all members, including methods of fastening;
  - (ii) the details of the closing devices;
  - (iii) the bilge pumping arrangements;
  - (iv) the details of the oil fuel system, including tanks, filling and venting arrangements, piping and valves;
  - (v) where applicable, the arrangements for the loading, carriage and discharge of liquid cargoes;
  - (vi) the structural fire, protection arrangements and fixed fire appliances;
  - (vii) the details of the rudder and stern frame, propeller brackets, engine and thrust seatings, propeller shafting, bearings and couplings, steering gear and alternative method of steering;
  - (viii) where applicable, the welding schedule, the laminating schedule or the plastering programme;
  - (ix) electrical equipment and wiring.
- (f) the preliminary stability information; and
- (g) such further plans, information and data as the Fiji Marine Board may require to determine the proper construction, machinery, equipment and safety of the vessel.

APPENDIX A

CLARIFICATION OF TERMS USED IN  
DEFINITION OF MEASURED LENGTH  
(as referred to in Clause 4)

The following terms used in the definition of Measured Length should be interpreted as follows:

*Fore part of hull*—The leading edge of the shell plating, planking or other structural material or, in the case of bar stems or stem posts, the intersection of the outside of the shell plating or planking with the stem bar or post but, in all cases, excluding any member added to the exterior of the hull e.g. fender, sponson, rubbing strip, etc.

*After part of the hull*—The trailing edge of the shell plating, planking or other structural material or, in the case of stern bars or posts, the intersection of the outside of the shell plating or planking with the stern bar or post but, in all cases, excluding any member added to the exterior of the hull, e.g. fender, sponson, rubbing strip, etc.

*Height of gunwale*—The top edge of the fore and after member which is fitted round the inside of the vessel at the top of the side shell plating, planking or other structural material.

As a further guide to the interpretation of Measured Length reference should be made to the Guidance for Measuring Diagrams included in this appendix.

MEASURED LENGTH  
GUIDANCE FOR MEASURING—SHEET 1

PART OF HULL

BAR STEM OR STEM POST.

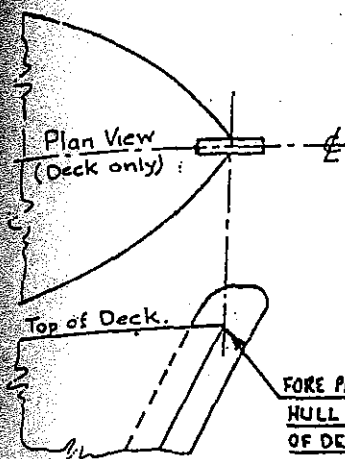
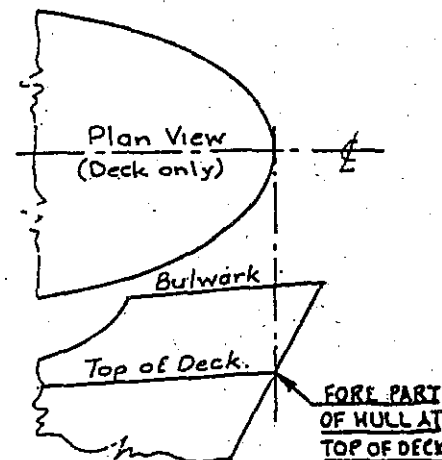
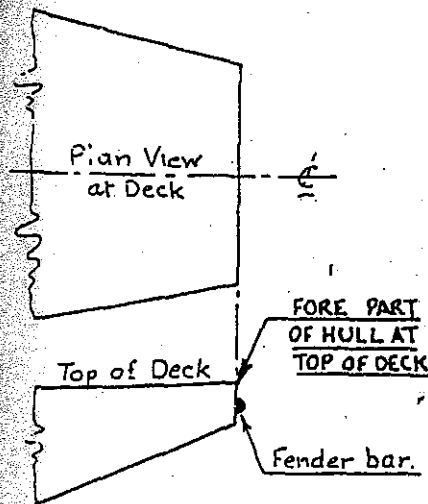


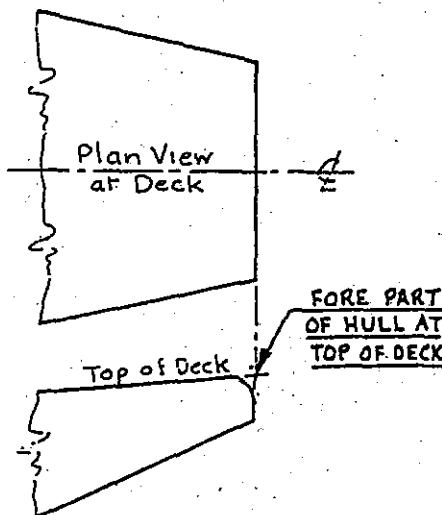
PLATE OR MOULDED STEM.



SWIM END



SWIM END - Radiused Deck Plate.

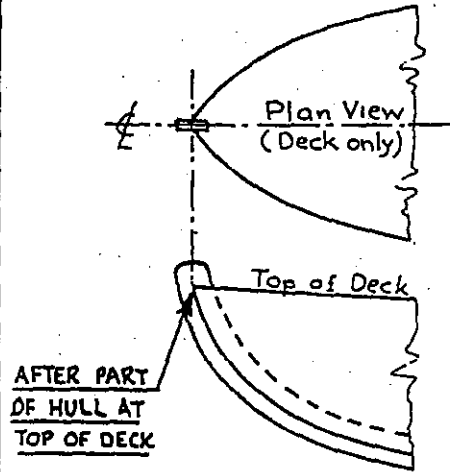


AFTER PART OF HULL.

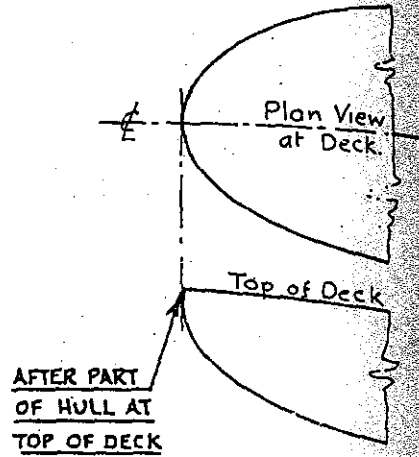
Section 1

AFTER PART OF HULL (Cont.)

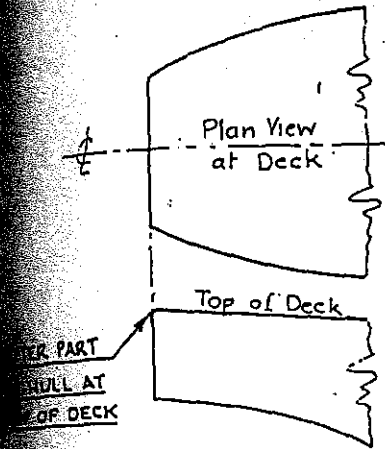
CANOE STERN.



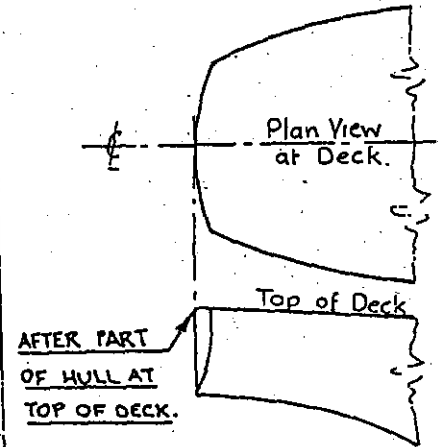
ROUND STERN.



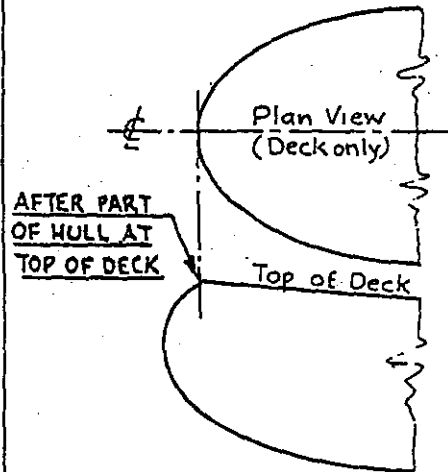
TUCK STERN - SQUARE.



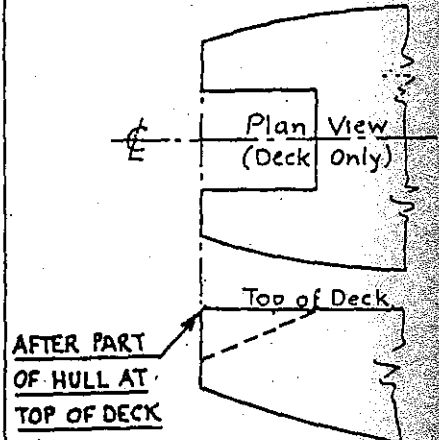
TUCK STERN - ROUND.



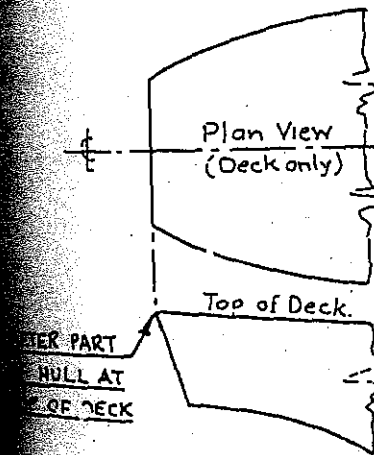
CRUISER STERN.



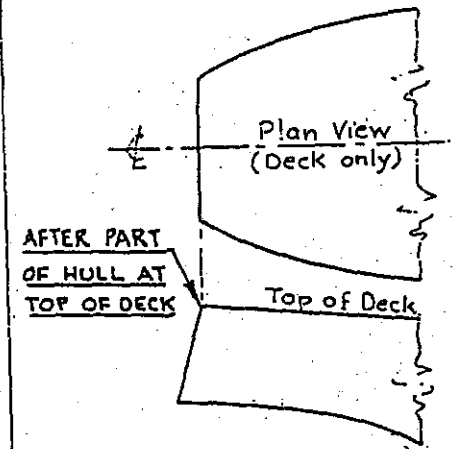
RAMP STERN:



TUCK STERN - RAKED AFT.



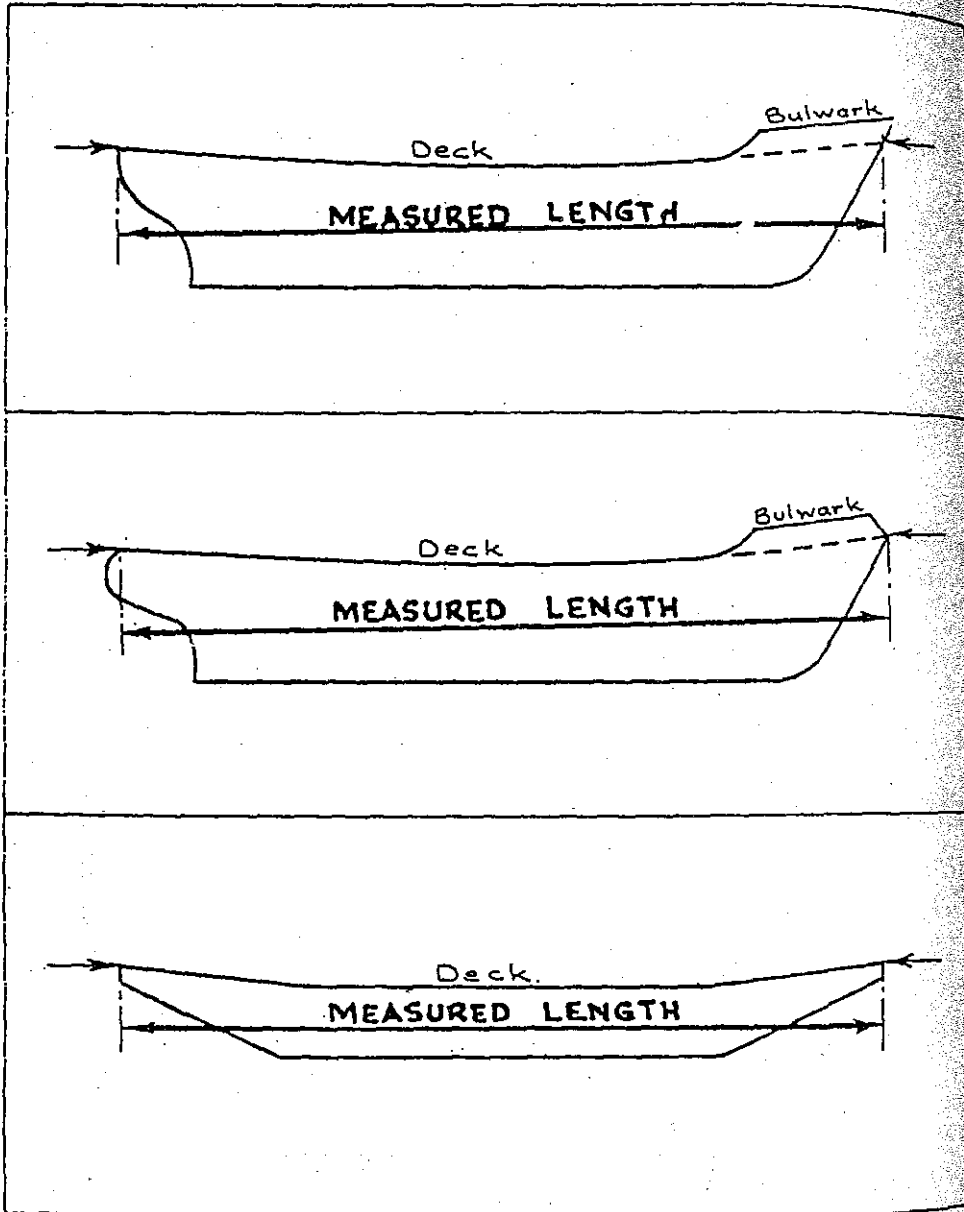
TUCK STERN - RAKED FORWARD.



MEASURED LENGTH  
GUIDANCE FOR MEASURING—SHEET 4

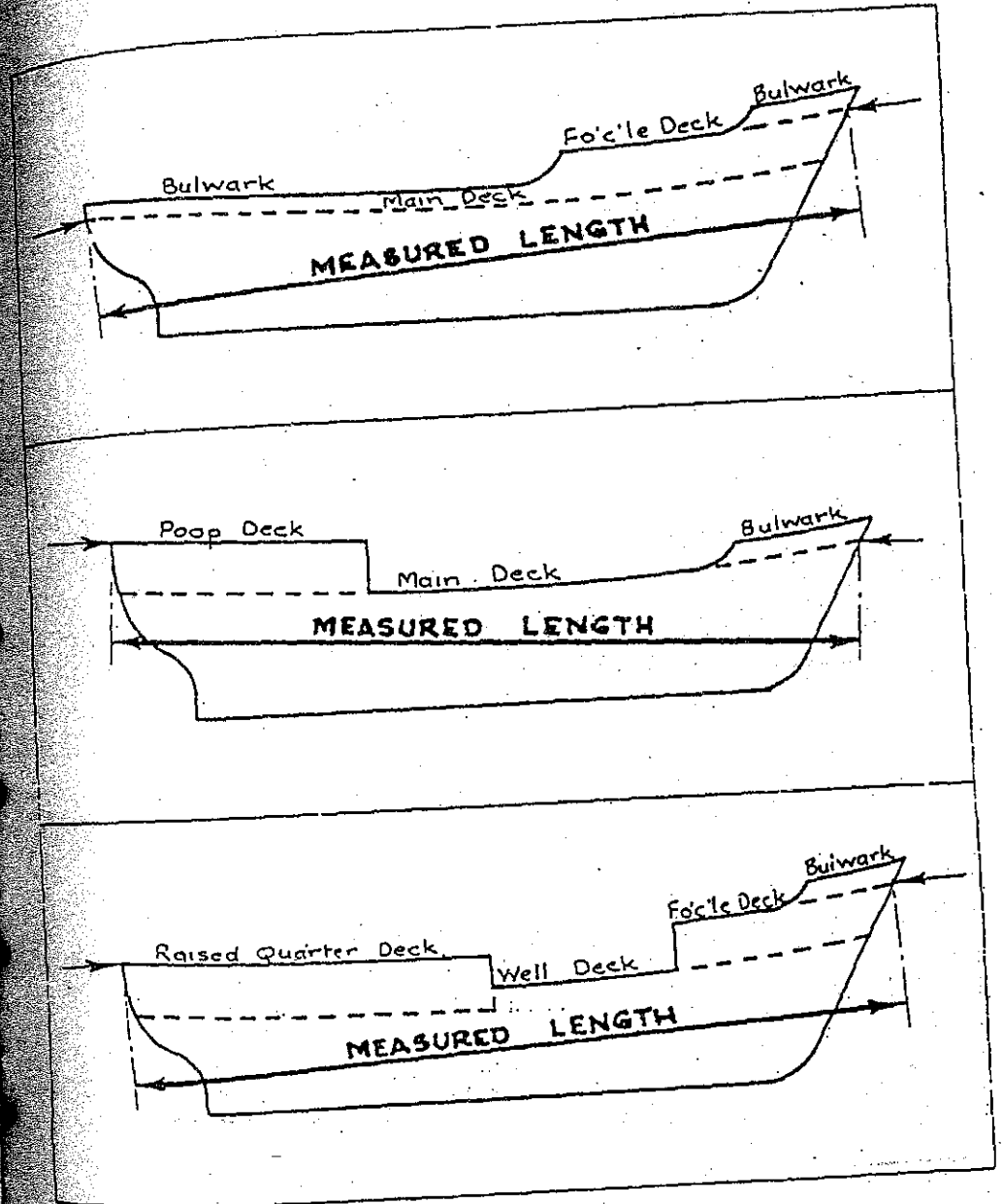
SINGLE DECK VESSELS

Section 1



MEASURED LENGTH  
GUIDANCE FOR MEASURING—SHEET 5

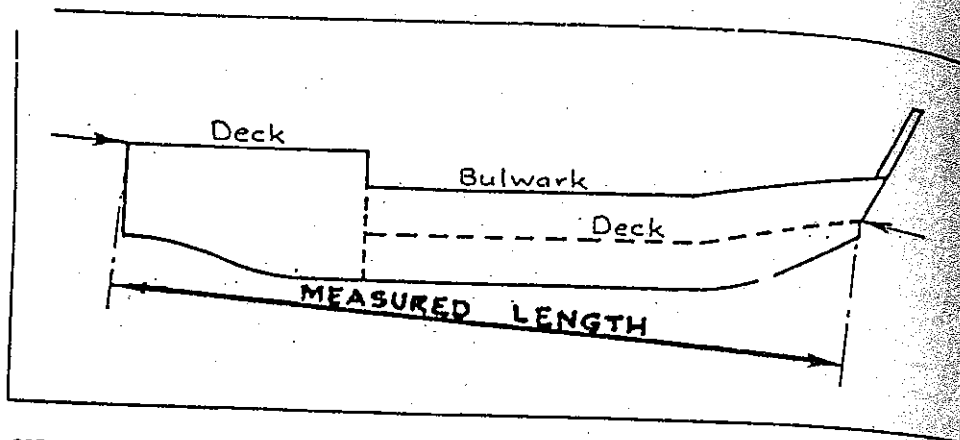
MULTIPLE DECK VESSELS



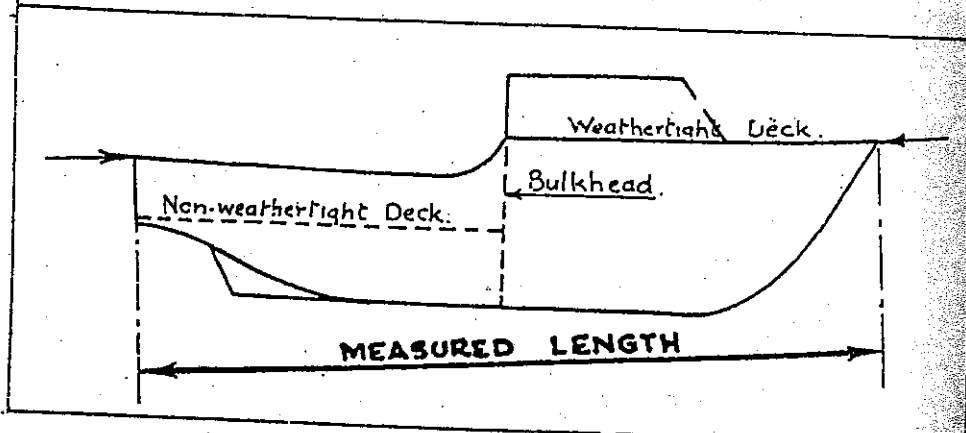
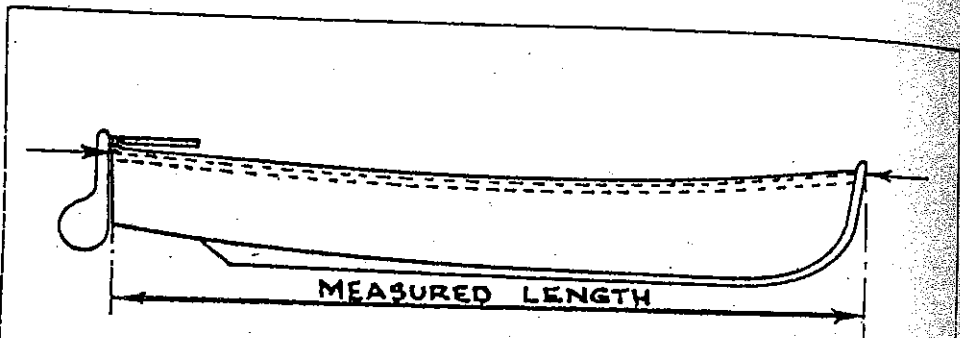


MEASURED LENGTH  
GUIDANCE FOR MEASURING - SHEET 6

LANDING BARGES, ETC



OPEN VESSELS



MEASURED LENGTH  
GUIDANCE FOR MEASURING - SHEET 7

MEASURING ON EXISTING VESSEL

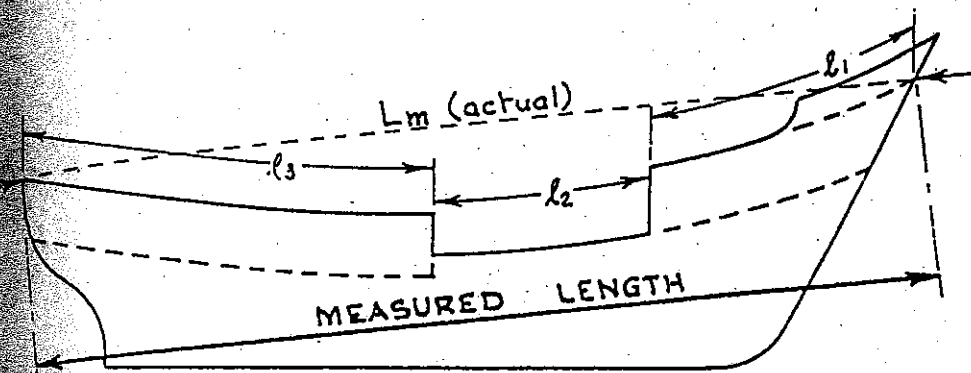
Measurement should, wherever possible, be taken in a direct line between the two defined extremities.

On an existing vessel (this would normally be achieved by setting up sight boards at the stem and stern, together with as many intermediate sights as are necessary to circumvent obstructions or breaks in the uppermost weathertight deck or, if the vessel is out of the water, by measuring between plumb lines dropped from the defined extremities, in which case, care should be taken to ensure that the measurement is taken between points on the plumb lines which are equidistant from the points of origin (i.e. the level of deck or gunwale).

However, the measurement should be taken, when agreed to by the Authority and the owner, by means of a tape laid along the deck. It is a fact that the measurement thus taken will be in excess of the true measurement due to the curvature of the deck, as illustrated in the sketch below where the sheer of the deck has been exaggerated for clarity. In most cases this increase in length will be of little concern, however, if the measurement is critical, the length should be checked by either of the two methods described above.

MEASUREMENT OF LENGTH ( $L_m$ ) BY TAPE LAID ON DECK

Note: Sheer exaggerated for clarity.



$$L_m = l_1 + l_2 + l_3 \text{ (approx.)}$$

## APPENDIX B

## BOUNDARIES OF SHORT COASTING SERVICE AREAS

## 1. VITI LEVU

The sea area bounded on the landward side by the main island and, on the seaward side by the inside edge of:

1.1 Suva Harbour outer reef to Nukulau Island to the Rewa River.

1.2 Tomberua Passage to Moturiki, then the East and North Coasts of Ovalau to Levuka.

1.3 North Coast of Levuka along the 100 fathom contour to Nananu Passage to Manava Passage to Ba Passage.

1.4 The reef from Ba Passage to Vomo Island, then a straight line to the Northern most of the Mamanuca Islands, the Mamanuca Reefs, the Malolo Barrier Reef to Navula Reef Light, to Uverite Point.

1.5 Serua Harbour to Beqa Reef to Navua River.

## 2. VANUA LEVU

The sea area bounded on the landward side by the main land and, on the seaward side by the inside edge of:

2.1 The 100 fathom line of the Somosomo Strait and the Rabi Channel, the Texas Reef then a straight line on a bearing of 260 degrees True, to the main land.

2.2 The reef from Udu Point to Sausau Passage, to Mali Passage, to Kia Island to Yaggaga Island, then within 1 mile of the main land to Bua Bay, then a straight line to Vuya Passage of the Namena Barrier Reef, then following the Namena Barrier Reef to Nasonisoni Passage to Nyavu Passage.

2.3. Savusavu Bay.

## 3. TAVEUNI

The sea area bounded on the landward side by the main island and, on the seaward side by the 100 fathom line from Vuna Reef Light to Black Point, then a line 1 mile from the reef to north end of Taveuni, then to the inside of the reef surrounding the Laucafa Island only.

## 4. VANUA LEVU TO TAVEUNI

A two mile wide sea area at the narrowest point of the Somosomo Strait between the two sea areas defined in 2 and 3 above.

NOTE: There is no Short Coasting Service area joining VITI LEVU to VANUA LEVU, SUVA to BEQA, or SAVUSAVU Eastwards to SOMOSOMO.

## SECTION 2

## CERTIFICATE OF COMPETENCY

1. This Section should be read in conjunction with the Introduction, Definition and General Requirements Section.
2. Full details of the Certificates of Competency requirements are contained in the Marine (Certificates of Competency and Manning of Vessels) Regulations, 1989. These Regulations are made up of a number of other Regulations.
3. Regulations 5 to 20 of the Marine (Certificates of Competency and Manning of Vessels) (General) Regulations, 1989, which are set out in the Schedule to this Section, describe the general scheme and indicate the function of each subsidiary set of Regulations so that a person interested in acquiring a Certificate of Competency may know which Regulations he needs to refer to.
4. The Certificates of Competency required in respect of fishing vessels can be found in the Marine (Fishing Vessels—Certificates of Competency and Manning of Vessels) Regulations, 1989.

## SCHEDULE

*Regulations 5 to 20 of the Marine (Certificates of Competency and Manning of Vessels) (General) Regulations, 1989*

*Grades of certificates of competency which may be issued*

5. The Marine Board may, under subsection 99(3) of the Act, issue certificates of competency in the following grades, namely—

(a) in respect of deck officers—

- (i) Grade 1 Master;
- (ii) Grade 2 Master;
- (iii) Grade 3 Master;
- (iv) Grade 4 Master;
- (v) Grade 5 Master;
- (vi) Grade 1 Mate;
- (vii) Grade 2 Mate;
- (viii) Grade 3 Mate;
- (ix) Grade 4 Mate;
- (x) Grade 5 Mate;
- (xi) Sailing Licence (Seagoing Service);
- (xii) Sailing Licence (Short Coasting Service);
- (xiii) Sailing Licence (Harbour and River Craft);

(b) in respect of engineering officers—

- (i) Engineer Grade 1;
- (ii) Engineer Grade 2;
- (iii) Engineer Grade 3;
- (iv) Engineer Grade 4;
- (v) Engineer Grade 5;
- (vi) Engine Operator;

- (c) in respect of ratings—
- (i) Deck Watchkeeping Rating Certificate;
  - (ii) Able Seaman Certificate;
  - (iii) Engine Room Watchkeeping Rating Certificate.

*Marine Board not to issue certificates of competency except to qualified persons*

6.—(1) The Marine Board shall not issue a certificate of competency to an applicant unless it first satisfies itself that—

- (a) the applicant has passed any appropriate examination leading to a qualification for the grade of certificate applied for; and
  - (b) the applicant has successfully completed any supplementary courses appropriate to that grade of certificate.
- (2) The appropriate examination leading to a qualification for each grade of certificate of competency that must be passed for the purpose of paragraph (1)(a), and the syllabuses in respect of each of those examinations are prescribed—
- (a) in respect of deck officers—in the Marine (Certificates of Competency (Examinations Syllabuses) (Deck Officers)) Regulations, 1989;
  - (b) in respect of engineering officers—in the Marine (Certificates of Competency (Examination Syllabuses) (Engineering Officers)) Regulations, 1989; and
  - (c) in respect of ratings—in the Marine (Certificates of Competency (Required Qualifications) (Ratings)) Regulations, 1989.
- (3) The appropriate supplementary courses that must be successfully completed for the purposes of paragraph (1)(b) before a grade of certificate of competency may be applied for, and the aims and scopes of those courses are prescribed in the Marine (Certificates of Competency (Supplementary Courses)) Regulations, 1989.

*Conduct of examinations for certificates of competency*

7.—(1) The Marine Board may conduct, or approve the conduct of, examinations leading to qualifications for each grade of certificate of competency.

(2) The examinations referred to in subregulation (1) shall be conducted in the manner prescribed in the Marine (Certificates of Competency (Conduct of Examinations)) Regulations, 1989.

*Conditions of entry to examinations for certificates of competency*

8.—(1) The Marine Board shall not permit a person to enter for an examination leading to a qualification for a grade of certificate of competency unless it first satisfies itself that the applicant has the qualifications and has satisfied the other prerequisite prescribed in respect of that examination.

(2) The qualifications and prerequisite referred to in subregulation (1) are prescribed—

- (a) in respect of deck officers—in the Marine (Certificates of Competency (Qualifications for Entry to Examinations) (Deck Officers)) Regulations, 1989;
- (b) in respect of engineering officers—in the Marine (Certificates of Competency (Qualifications for Entry to Examinations) (Engineering Officers)) Regulations, 1989; and
- (c) in respect of ratings—in the Marine (Certificates of Competency (Required Qualifications) (Ratings)) Regulations, 1989.

*Examination fees*

9. The fees to be paid by candidates to enter for an examination leading to a qualification for the various grades of certificates of competency are prescribed in the Marine (Fees) Regulations, 1989.

*Application for certificate of competency*

10. The prescribed application form for a certificate of competency is the form specified in Schedule 1.

*Application fee for a certificate of competency*

11.—(1) The prescribed application fee for a certificate of competency is prescribed in the Marine (Fees) Regulations, 1989.

(2) The fee prescribed under subregulation (1) shall also apply in respect of a document issued under subregulation 13(2).

*Any lower grade certificate of competency to be surrendered*

12.—(1) Where an applicant for a certificate of competency is already the holder of a lower grade certificate of competency he shall surrender that lower grade certificate to the Marine Board on the issue to him by the Board of the Higher grade certificate.

(2) The Marine Board may refuse to issue a certificate of competency to a person who fails to comply with subregulation (1).

*Marine Board may decline to issue certificates of competency to certain people*

13.—(1) Where an application for a certificate of competency is made by a person who is neither a citizen of Fiji nor of any other country which is a member of the South Pacific Forum it may decline to issue the certificate applied for.

(2) Where the marine Board, acting in accordance with subregulation (1), declines to issue a certificate of competency to a person who would otherwise be entitled to the issue of that certificate the Board shall instead issue that person with a document, in a form approved by the Marine Board, certifying the examination results of the applicant in respect of any examination which the applicant sat and which would otherwise have led to a qualification for a certificate of competency.

(3) A document issued under subregulation (2) shall, as far as practicable, be in such form as to satisfy the reasonable requirements of the appropriate authorities in the applicant's home country.

*Form of certificate of competency*

14.—(1) A certificate of competency shall be in the form specified in Part 1—of Schedule 2.

(2) A certificate of competency shall bear an endorsement in the form specified in Part 2 of Schedule 2.

(3) A certificate of competency shall bear a certificate in the form specified in Part 3 of Schedule 2.

(4) A certificate of competency shall state its period of validity and shall contain spaces where endorsements revalidating the certificate may be entered.

(5) A certificate of competency shall contain spaces in which endorsements certifying that the holder of the certificate has obtained further qualification may be entered.

(6) A certificate of competency shall contain spaces in which any limitation on or exceptions to the certificate may be endorsed.

(7) Details of revalidation under subregulation (4) or endorsements under subregulations (5) and (6) may be made in writing, by rubber stamp, printed slip or similar method and shall be certified by or on behalf of the Marine Board.

*Capacities that holders of certificates of competency may serve in on a registered vessel*

15. The capacities that the holders of each grade of certificate of competency may serve in on a registered vessel are set out in the Marine (Certificates of Competency (Authorised Capacities)) Regulations, 1989.

*Manning requirements on registered vessels*

16. For the purpose of subsection 98(1) of the Act, the manning requirements in respect of a registered vessel shall be determined in accordance with the Marine (Manning of Vessels) Regulations, 1989.

*Additional requirements in respect of tankers*

17. The Marine (Certificates of Competency (Tankers and Dangerous Cargoes)) Regulations, 1989—

- (a) specify that the holders of certain positions of responsibility on an oil, chemical or gas tanker must hold additional qualifications; and
- (b) specify how those qualifications may be obtained.

*Revalidation of certificates of competency*

18.—(1) A certificate of competency is valid for seagoing purposes until the date specified in it but may be revalidated for these purposes.

(2) The Marine Board shall not validate a certificate of competency for seagoing purposes for a period exceeding 5 years, nor shall it revalidate a certificate of competency for seagoing purposes for a period exceeding 5 years.

(3) The manner in which a certificate of competency may be revalidated for seagoing purposes and any requirements to be complied with on that revalidation are prescribed in the Marine (Certificate of Competency (Revalidation)) Regulations, 1989.

*Transitional provision*

19. The Marine (Certificates of Competency (Transitional Provisions)) Regulations, 1989 provide—

- (a) for the recognition of certificates of competency issued before these Regulations came into operation;
- (b) for the continued issue of certificates of competency of the type issued before these Regulations came into operation where a seafarer's training had been started under the previous system of training; and
- (c) for the issue of certificates of service to persons who had seagoing experience but were not the holders of certificates of competency issued before these Regulations came into operation.

*Review of decisions of Marine Board*

20.—(1) A person aggrieved by a decision of the Marine Board in respect of the grant, endorsement or revalidation of a certificate of competency or service may apply to the Board for a reviews of the decision.

(2) An application for review under subregulation (1) must be accompanied by the fee prescribed by the Marine (Fees) Regulations, 1989.

(3) On receipt of an application under subregulation (1) the Marine Board shall refer it to a person or persons appointed by the Minister to hear reviews.

(4) The Marine Board shall give a person or the persons appointed in accordance with subregulation (3) all necessary details and assistance necessary to allow him or them to determine the review.

(5) The decision of a person or persons appointed in accordance with subregulation (3) on a review referred to him or them under that subregulation shall be deemed to be decision of the Marine Board and shall have effect accordingly.

(6) A person or persons appointed under subregulation (3) may, where appropriate, be a person or include a person with experience in the relevant field of knowledge or experience.

## SECTION 3

### SAFETY MANNING

1. This Section should be read in conjunction with the Introduction, Definitions and General Requirements Section.
2. Full details of safety manning requirements are contained in the Marine (Manning of Vessels) Regulations, 1989. This Section describes the principal provisions of those regulations for the general guidance of owners, masters and seamen. A number in brackets refers to the regulation number of the relevant regulation.
3. (4) Safety manning regulations apply to registered vessels including fishing vessels, Government vessels, and trading vessels any of which are 10 metres or more in length.
4. (6) The vessel must display a "Manning certificate" issued by the Marine Board, stating the minimum number of qualified and other persons to be carried.
5. (7) The owner of a vessel must apply to the Marine Board for the issue of a Manning Certificate in respect of the vessel. The Marine Board must refer the application to the Manning Committee.
6. (10) The Manning Committee consists of—  
the Director of Marine;  
a deck officer (a public officer administering the Act);  
an engineering officer (a public officer administering the Act);  
a deck officer (with extensive seagoing commercial ship experience); and  
an engineering officer (with extensive seagoing commercial ship experience).
7. (14) In deciding the minimum safety manning requirements of the vessel the Committee is guided by IMO Resolution A 481(XII) Principles of Safe Manning, and the manning tables Parts 1 to 4 set out in the Schedule to this Section.
8. (18) Dispensations from the manning scale may be issued only in cases of exceptional necessity and only after careful consideration by The Marine Board.

## SCHEDULE

*This Schedule prescribes the minimum grade of certificate of competency required for the respective position on vessels to which the Regulations apply, for vessels engaged in the relevant operations.*

## PART 1

## Deck officers

## UNLIMITED TRADE

Ship—Gross Tonnage (length)	Master	Chief Mate	2nd Mate	3rd Mate
1600 GT and over (80m length and over)	Grade 1 (Master)	Grade 1 (Mate)	Grade 3 (Mate)	Grade 3 (Mate)
less than 1600 GT (less than 80m length)	Grade 2 (Master)	Grade 2 (Mate)	Grade 3 (Mate)	Grade 3 (Mate)

## PACIFIC REGION TRADE

Ship—Gross Tonnage (length)	Master	Chief Mate	2nd Mate	3rd Mate
1600 GT and over (80m length and over)	Grade 2 (Master)	Grade 2 (Mate)	Grade 3 (Mate)	Grade 4
less than 1600 GT (less than 80m length)	Grade 3 (Master)	Grade 3 (Mate)	Grade 4 (Mate)	

## FIJI ISLANDS TRADE

Ship—Gross Tonnage (length)	Master	Chief Mate	2nd Mate	3rd Mate
1600 GT and over (80m length and over)	Grade 2 (Master)	Grade 2 (Mate)	Grade 3 (Mate)	
1000 GT—1600 GT (60m—80m length)	Grade 3 (Master)	Grade 3 (Mate)	Grade 4 (Mate)	
200 GT—1000 GT (35m—60m length)	Grade 4 (Master)	Grade 4 (Mate)		
less than 200 GT (less than 35m length)	Grade 5 (Master)	Grade 5 (Mate)		

## PART 3

## Ratings

## A. Able Seaman (AB) and Deck Watchkeeping Ratings (DW)

Size of vessel	Unlimited trade	Pacific Region trade	Fiji islands trade
200 gross tonnage and over or 35 metres or over in length	1AB 2DW	1AB 2DW	1AB 1DW
less than 200 gross tonnage or less than 35 metres in length	1AB 1DW	1AB 1DW	1DW

## B. Engineeroom Watchkeeping Ratings (EW)

Propulsion power of vessels	Unlimited trade	Pacific region trade	Fiji islands trade
750KW or more	3EW	3EW	2EW
200 KW or more but under 750KW	2EW	2EW	1EW
Under 200KW	1EW	—	—

## C. Qualified Cooks

	Minimum number of other crew required under the safe manning certificate	Number of qualified cooks required
	10 or more but less than 20	1
	20 or more	2

A qualified cook means a person who hold a Certificate of Approved Trade Test for Cooks Class 3 issued by the Fiji National Training Council, or an equivalent Certificate approved by the Marine Board.

## HARBOURS, RIVERS, SHORT COASTING

## AND SEAGOING SERVICE

	Master	Mate
200 GT—and over (35m and over)	Grade 4 Master	Grade 4 Mate
100 GT—200 GT (20m—35m length)	Grade 5 Master	Grade 5 Mate
less than 100 GT	Sailing Licence	Nil.

(lengths are for guidance purposes only)

## PART 2

## Engineering Officers

## Unlimited Trade

Propulsion Power	Chief Engineer	Second Engineer	Watchkeeper
3000 KW and over	1	2	3
750—2999 KW	2	3	3
Under 750 KW	2	3	4

## PACIFIC REGION TRADE

Propulsion Power	Chief Engineer	Second Engineer	Watchkeeper
3000KW and over	1	2	3
750—2999 KW	2	3	3
400—749 KW	3	4	—
200—399 KW	3	5	—
Under 200 KW	5	—	—

## FIJI ISLANDS TRADE

Propulsion Power	Chief Engineer	Second Engineer	Watchkeeper
3000 KW and over	1	2	3
750—2999 KW	2	3	4
400—750 KW	3	4	—
200—399 KW	4	5	—
Under 200 KW	5	—	—
Under 100 KW	Engine Operator	—	—

## SECTION 4

## MERCANTILE MARINE

1. This Section should be read in conjunction with the Introduction, Definitions and General Requirements Section.
2. Full details of Mercantile Marine requirements are contained in the Marine (Masters and Seamen) Regulations, 1989. This Section describes the principal provisions of those regulations for the general guidance of masters and seamen. A number in brackets refers to the regulation number of the relevant regulation.
  - 3.1 (5) (a) *Coastal Vessels 200 GT and over, and all overseas trading vessels* must have an agreement that substantially complies with the agreement set out in the Schedule to the Regulations.
    - (b) Other vessels must have an agreement approved by a Shipping Officer. This allows for flexibility for smaller vessels and their special needs.
  - 3.2 (6-10) Owner applies to Shipping Officer to open agreement with a seaman. Shipping Officer checks that the standard clauses are in agreement with the Act and any non standard clauses comply with Act. Owner informs the Shipping Officer the agreement has been made, and the list of seamen to whom it applies. The Shipping Officer checks the seamen are registered seamen and each holds a "Seaman's Employment Record Book".
 

A Copy of the Agreement is displayed on the vessel (for seaman to see), and a copy is displayed in the owner's office in Fiji.
  - 3.3 (11) A multiple ship agreement may be made—this is suitable for a multiple ship company where seamen are changing ships frequently, on short voyages (to cut out unnecessary signing on/off the main agreement). Basically a seaman signs the main agreement, to be bound by the agreement while he is actually on a crew list of one of the company's vessels. The crew list will have endorsed on it a statement that it binds the seaman to the agreement. (It becomes binding by the seaman signing against his name on the crew list, and the Master signing last). It becomes revoked at the end of the voyage to which the crew list refers. It is up to the company to develop this system to their own requirements—shipping officer to approve.
 

Contract has 2 years validity, which allows Shipping Officer to review its suitability.
  - 3.4 (12, 13) Termination of the Agreement with a seaman. Notify intention to Shipping Officer, (who will check that correct procedure is carried out, and amend records of seamen's whereabouts and also ensure their Employment record books have been properly recorded). There are special conditions for terminating an agreement outside Fiji.
  - 3.5 (14) There is special protection for seamen being left behind outside Fiji.
  - 3.6 (15) Employment of persons over 16 years old but under 18 years requires a medical check. Hours of work are also limited.

- 3.7 (16) All seamen must undergo a medical examination prior to employment. The medical examination is carried out in accordance with the Marine (Medical Examination of Seafarers) Examination (Under the Marine (Certificates of Competency and Manning of Vessels) Regulations, 1989). (Candidates for Certificates will require a medical Certificate valid within one year; and the 5 year re-validation of certificates also requires medical examination valid within 1 year.)
- 3.8 (17-20) Wages and deductions. Proper accounts must be given to the seaman on termination of Agreement. The seaman may make allotments of his wages to not more than 2 people.
- 3.9 (21, 22, 23) Crew accommodation must meet minimum standards specified in section 6 of this Code.
- 3.10 (24) There must be adequate water and provisions on a vessel. These provisions must be of good quality, of nutritive value and of sufficient variety. They must also be free of anything likely to cause harm or render them uneatable.
- 3.11 (25) Medical stores are to be carried as specified in Section 13 of this Code.
- 3.12 (26-32) The Section concerning the treatment of distressed seamen, and the personal effects of distressed and deceased seamen.
- 3.13 (33-37) Discipline—there are no fines imposed. The only discipline available is that a guilty seaman has the offence officially recorded in the Official Log Book of the vessel and a return is sent to the Shipping Office.
- If two such records against a seaman occur within a two year period the Director of Marine may suspend the seaman from employment for a period of time. The Director will take possession of the seaman's Employment Record Book which effectively bars him from further employment as a seaman.
- 3.14 (38-39) Returns of births and deaths on vessels which must be made.
- 3.15 (40) Gives details of how a Seaman's Employment Record Book is obtained and what must be done with it.
- 3.16 (41-42) Official Log Book of a vessel—How entries must be made in it and to whom it must be produced.
- 3.17 (43-44) Crew lists. What a list must contain and to whom it must be produced.
- 3.18 (Schedules) Forms which relate to the contractual conditions of Seamen; and, copies of the Official Log Book, all which are available at the Marine Department Shipping Office.

## CONSTRUCTION AND STABILITY

- Part 1 : Preliminary
- Part 2 : General Requirements for Vessels
- 2.1 : Structural Strength
- 2.2 : Design Loadings
- 2.3 : Anchors and Cables
- Part 3 : Requirements for Safety Convention ships
- 3.1 : Watertight Subdivision
- 3.2 : Structural Fire Protection
- 3.3 : Stability
- 3.4 : Rudders and Steering Gear
- Part 4 : Requirements for ships other than Safety Convention ships
- 4.1 : Watertight Subdivision
- 4.2 : Structural Fire Protection
- 4.3 : Stability
- 4.4 : Rudders and Steering Gear
- Part 5 : Miscellaneous Provisions
- 5.1 : Modifications for existing ships

## PART 1—PRELIMINARY

This Section should be read in conjunction with the Introduction, Definitions and General Requirements Section.

In this Section:

- (a) the provisions of Part 2 apply to all ships;
- (b) the provisions of Part 3 apply to Safety Convention ships; and
- (c) the provisions of Part 4 and Part 5 apply to ships other than Safety Convention ships.

## PART 2—GENERAL REQUIREMENTS FOR VESSELS

## 2.1 Structural Strength

2.1.1 Subject to particular requirements in this Section, the structural strength of every vessel shall be sufficient for the service for which the vessel is intended.

2.1.2 A vessel constructed in accordance with the appropriate rules of a Classification Society or with the appropriate provisions of this Part shall be accepted as complying with 2.1.1 of this Part.

2.1.3 The structural requirements for a vessel of unusual design shall be to the satisfaction of the Fiji Marine Board.

2.1.4 The structural requirements for a vessel constructed wholly or partly of materials not specifically included in requirements referred to in 2.1.2 of this Part shall be to the satisfaction of the Fiji Marine Board. In determining structural requirements not otherwise specified, regard shall be had to the following Sub-Sections of Section 5 of the Australian Uniform Shipping Laws Code:

Sub-Section H—Aluminium

Sub-Section I—Copper Nickel

Sub-Section J—Ferro-Cement

Sub-Section K—Glass Reinforced Plastic

Sub-Section L—Steel

Sub-Section M—Timber

## 2.2 Design Loadings

For the purpose of paragraph 2.1.2 of this Part, where a vessel is not constructed in accordance with the rules of a Classification Society, then the structure shall be designed to the satisfaction of the Fiji Marine Board and having regard to Part II of Sub-Section G, Section 5 of the Australian Uniform Shipping Laws Code.

## 2.3 Anchors and Cables

## 2.3.1 Equipment to be Provided

Every vessel shall be provided with anchor equipment designed for quick and safe operation which shall consist of anchors, cables, stoppers and a windlass or other arrangements for dropping and hoisting the anchor and for holding the vessel at anchor in all foreseeable service conditions.

## 2.3.2 Acceptable Equipment

For the purposes of paragraph 2.3.1, equipment shall comply with Section 13, Miscellaneous Equipment.

## 2.3.3 Anchor Windlass

Where requirements in respect of an anchor windlass are not otherwise provided under paragraph 2.3.2, the requirements of this paragraph shall be met as follows:

- (a) The windlass shall be of sufficient power to lift each anchor and its full length of cable.
- (b) Each cable lifter shall be fitted with a release coupling and a brake sufficient capacity for the safe stopping of anchors and cable when paying out.
- (c) A windlass with brake engaged and release couplings disengaged shall be able to withstand a static pull of 45% of the required cable minimum breaking strength on all cable lifters simultaneously and without any brake slip.
- (d) If a chain stopper is not fitted, a windlass 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 cable locker when the vessel is at sea.

## PART 3—REQUIREMENTS FOR SAFETY CONVENTION SHIPS

## 3.1 Watertight Subdivision

The requirements for watertight subdivision of Safety Convention ships are dealt with under the relevant provisions of Chapter 11—1 of the Safety Convention with particular reference to Part 8 of that Chapter. (Subdivision and Stability).

## 3.2 Structural Fire Protection

The requirements for structural fire protection of Safety Convention ships are dealt with under the relevant provisions of Chapter 11—2 of the Safety Convention, with particular reference to the following Parts of that Chapter.

- Part B—Fire Safety Measures for Passenger Ships;
- Part C—Fire Safety Measures for Cargo Ships; and
- Part D—Fire Safety Measures for Tankers

## 3.3 Stability

The requirements for stability for Safety Convention ships are dealt with under the relevant provisions of Chapter 11—1 of the Safety Convention with particular reference to the following Regulations of Part B of that Chapter:

- Regulation 8—Stability of Passenger Ships in Damaged Condition;
- Regulation 9—Ballasting of Passenger Ships;
- Regulation 21—Bilge Pumping Arrangements;
- Regulation 22—Stability information for passenger ships and cargo ships; and
- Regulation 23—Damage Control Plans in Passenger Ships.

## 3.4 Rudders and Steering Gear

The requirements for the steering gear of Safety Convention ships are dealt with under the relevant provisions of Chapter 11—1 of the Safety Convention with particular reference to the following Regulations of Part C of that Chapter:

- Regulation 29—Steering gear; and
- Regulation 30—Additional requirements for electrical and electrohydraulic steering gear.



PART 4—REQUIREMENTS FOR SHIPS OTHER THAN SAFETY  
CONVENTION SHIPS

4.1 Watertight Subdivision

4.1.1 Bulkheads and other enclosures of watertight spaces and arrangements to maintain watertight integrity shall be designed, constructed and tested to the satisfaction of the Fiji Marine Board and having regard to the relevant provisions of Sub-Section C and D, Section 5, of the Australian Uniform Shipping Laws Code.

4.1.2 Every vessel shall be provided with an efficient system capable of pumping from or draining any watertight compartment not permanently appropriated for ship services and for which other efficient means of pumping are not provided. Arrangements of the system shall be to the satisfaction of the Fiji Marine Board, having regard to the provisions of Clause 17, Section 9, of the Australian Uniform Shipping Laws Code.

4.2 Structural Fire Protection

The hull, superstructure, structural bulkheads, decks, deckhouses and structural components below decks shall be so constructed as to provide the fullest practicable degree of fire protection to the satisfaction of the Fiji Marine Board and having regard to the relevant provisions of Sub-Section F, Section 5, of the Australian Uniform Shipping Laws Code.

4.3 Stability

4.3.1 A ship shall be so designed and constructed as to provide adequate intact stability for the anticipated service conditions which shall be determined according to criteria acceptable to the Fiji Marine Board.

4.3.2 Every ship shall at all times be provided with information acceptable to the Fiji Marine Board, relating to the ship's stability characteristics under different service conditions.

4.3.3 In determining requirements under 4.3.1. and 4.3.2 regard shall be had to Section 8 of the Australian Uniform Shipping Laws Code.

4.4 Rudders and Steering gear

4.4.1 Every vessel shall be provided with a main steering gear and with an auxiliary means of actuating the rudder.

4.4.2 For the purposes of paragraph 4.4.1. the provisions shall be to the satisfaction of the Fiji Marine Board and having regard to the appropriate rules of a Classification Society and to the following clauses of Part 3, Section 9, of the Australian Uniform Shipping Laws Code.

Clause 21—Steering Gear; and

Clause 22—Rudders and Rudder Stocks.

PART 5—MISCELLANEOUS PROVISIONS

5.1 Modifications for Existing Ships

In the case of a ship, other than a Safety Convention ship, that is an existing ship the Fiji Marine Board may permit such modifications to the requirements of this Part as it thinks, fit, having regard to:

(a) the age of the ship; and

(b) the trade in which the ship is, or is about to be, engaged.

SECTION 6

CREW ACCOMMODATION

1. This Section shall be read in conjunction with the Introduction, Definitions and General Requirements Section.

2. In this Section crew accommodation means the accommodation to be provided for the Master, Crew and Special Personnel.

3. Application

3.1 This Section applies to vessels of 10 metres and over.

3.2 The Fiji Marine Board may not require compliance with any of the provisions of this Section on vessels which are normally engaged on voyages for period of less than 36 hours, or in which the crew is not required to reside on board.

3.3 In addition the conditions may be varied in the case of any vessel if the Fiji Marine Board is satisfied after consultation with the vessel's owners that the variations made provide corresponding advantages as a result of which the overall conditions are not less favourable than those that would result from the full application of the provisions of the Section.

4. General

4.1 The location, means of access, structure and arrangement of crew accommodation in relation to other spaces shall be such as to ensure adequate security and protection against weather, sea and undue noise.

4.2 There shall be no direct openings into sleeping rooms from fish or cargo holds and spaces, from machinery spaces, from galleys, lamp and paint rooms or from engine, deck and other bulk store rooms, drying rooms, communal wash places or water closet spaces. That part of the bulkhead separating such places from sleeping rooms and external bulkheads shall be constructed of approved material and shall be watertight and gastight.

4.3 External bulkheads of sleeping rooms and mess rooms shall be adequately insulated. All machinery casings and all boundary bulkheads of galleys and other spaces in which heat is produced shall be adequately insulated where there is a possibility of resulting heat effects in adjoining accommodation or passageways. Protection shall be provided from heat effects of steam and/or hot-water service pipes.

4.4 Internal bulkheads shall be of material which is not likely to harbour vermin.

4.5 Sleeping rooms, mess rooms recreation rooms and passageways in the crew accommodation space shall be insulated to prevent condensation or overheating.

4.6 Main steam and exhaust pipes for winches and similar gear shall, whenever practicable, not pass through crew accommodation or through passageways leading to crew accommodation; where they do pass through such accommodation or passageways they shall be adequately insulated.

4.7 Inside panelling or sheeting shall be of material with a surface easily kept clean. Tongued and grooved boarding or any other form of construction likely to harbour vermin shall not be used.

4.8 The wall surface and deckheads in sleeping rooms and mess rooms shall be easily kept clean, and, if painted, shall be light in colour; lime wash must not be used.

4.9 The decks in all crew accommodation shall be of approved materials and construction and shall provide a surface impervious to damp and easily kept clean.

4.10 Exposed decks over crew accommodation shall be sheathed with wood or have equivalent insulation.

4.11 Where the floorings are of composition, the joinings with the sides shall be rounded to avoid crevices.

4.12 Sufficient drainage shall be provided.

4.13 All practical measures shall be taken to protect crew accommodation spaces against the admission of flies and other insects.

### 5. Ventilation

5.1 Crew accommodation spaces shall be adequately ventilated.

5.2 Vessels regularly engaged on voyages in the tropics and other areas with similar climatic conditions, shall be equipped both with mechanical means of ventilation and with electric fans. Provided that one only of these means may be required in spaces where this ensures satisfactory ventilation.

5.3 Power for the operation of the aids to ventilation required by sub-clause 5.2 shall, when practicable, be available at all times when the crew is living or working on board and conditions so require.

### 6. Heating

6.1 An adequate system of heating the crew accommodation shall be provided as required by climatic conditions. Vessels of Class 3 shall be exempted from this requirement.

6.2 The heating system shall, when practicable, be in operation at all times when the crew is living or working on board and conditions so require.

6.3 Heating by means of open fires shall be prohibited. Heaters, if used, shall be in a fixed position and so constructed as to reduce fire risks to a minimum. No such heater shall be fitted with a heating medium which is so exposed that clothing, curtains or other flammable materials can be scorched or set on fire by heat from the heater.

6.4 The heating system shall be capable of providing a temperature in crew accommodation at a satisfactory level under normal conditions of weather and climate likely to be met with on service.

### 7. Lighting

7.1 All crew spaces shall be adequately lit. The minimum standard for natural lighting in living rooms shall be such as to permit a person with normal vision to read on a clear day an ordinary newspaper in any part of the space available for free movement. When it is not possible to provide adequate natural lighting, artificial lighting of the above minimum standard shall be provided.

7.2 In all vessels electric lights shall, as far as practicable, be provided in the crew accommodation.

7.3 An adequate reading light shall be provided for every berth in addition to the normal lighting.

### 8. Free Movement Areas

8.1 The clear head room in areas of free movement shall, wherever possible be not less than 1.9 metres.

### 9. Sleeping Rooms

9.1 Sleeping rooms shall be in no case be forward of the collision bulkhead.

9.2 The floor area per person of sleeping rooms, excluding the space occupied by berths and fixed furniture shall not be less than:

Vessels Length in metres—	Area in square metres—
10 and over but less than 30.....	0.8
30 and over but less than 35.....	1.0
35 and over but less than 50.....	1.85
50 and over but less than 100.....	2.35
Over 100.....	2.78

Provided that, in the case of passenger ships in which more than 4 ratings are berthed in one room the minimum per person may be 2.22 square metres.

9.3 The number of persons allowed to occupy any sleeping room shall not exceed six.

9.4 The maximum number of persons allowed to occupy any sleeping room shall be legibly and indelibly marked in some place in the room where it can conveniently be seen.

9.5 Each member of the crew shall be provided with an individual berth.

9.6 Berths shall not be placed side by side in such a way that access to one berth can be obtained only over another.

9.7 Berths shall not be arranged in tiers of more than two.

9.8 The lower berth in a double tier shall not be less than 0.3m above the deck. The upper berth shall be placed approximately midway between the bottom of the lower berth and the lower side of the deckhead beams.

9.9 The minimum inside dimensions of a berth shall wherever practicable be 1.9 metres by 0.68 metres.

9.10 If tubular frames are used for the construction of berths, they shall be completely sealed and without perforations which would give access to vermin.

9.11 Each berth shall be fitted with a mattress.

9.12 When one berth is placed over another a dustproof base shall be fitted beneath the upper berth.

9.13 Each occupant shall be provided with a clothes locker of not less than 1.50m height and cross-sectional area 0.19 sq. metres fitted with a suitable locking device and a rod for holding clothes on hangers, and a drawer or equivalent space which shall be not less than 0.06 cubic metre.

9.14 Any furniture and fittings shall be of smooth, hard material not liable to warp or corrode, or to harbour vermin.

9.15 Sidelights in sleeping rooms shall be fitted with means of excluding light.

9.16 Each sleeping room shall be fitted with a mirror.

9.17 Wherever possible, a separate room should be provided for a member of the crew who suffers from illness or injury.

9.18 The number of persons allowed to occupy sleeping rooms shall not exceed the following maxima:

9.18.1 officers in charge of a department or a Watch: one person per room;

9.18.2 other officers and petty officers: not more than two persons per room;

9.18.3 other ratings: not more than 6 persons per room.

#### 10. Mess Rooms

10.1 Mess room accommodation separate from sleeping quarters shall be provided in all vessels carrying a crew of more than ten persons. Wherever possible it should be provided also in vessels carrying a smaller crew.

10.2 The dimensions of each mess room, where provided shall be sufficient for the number of persons using it at any time.

10.3 Mess rooms shall be equipped with tables and seats sufficient for the number of persons likely to use them at any one time.

10.4 Mess rooms shall be as close as practicable to the galley.

10.5 Adequate lockers for mess utensils and proper facilities for washing utensils shall be provided.

10.6 The tops of tables and seats shall be of dampresisting material without cracks and easily kept clean.

10.7 In vessels of more than 30 metres length there shall be a separate mess room for:

10.7.1 officers and berthed passengers;

10.7.2 ratings.

#### 11. Galley

11.1 Satisfactory cooking equipment shall be provided on board and shall, wherever practicable, be fitted in a separate galley.

11.2 The galley shall be of adequate dimensions for the purpose and shall be well lighted and ventilated.

11.3 The galley shall be equipped with cooking utensils, the necessary number of cupboards and shelves, and sinks and dish racks of rust-proof material and with satisfactory drainage. Where hot water is not supplied to the galley, an apparatus for heating water shall be provided.

11.4 Facilities shall be provided for the preparation of hot drinks for the crew at all times.

11.5 A cupboard, locker or storeroom of adequate capacity for messing provisions which can be kept dry, and well ventilated to avoid deterioration of stores shall be provided. Where necessary, refrigerators or other low-temperature storage space shall also be provided.

#### 12. Sanitation

12.1 Sufficient sanitary accommodation, including washing facilities shall be provided.

12.2 Sanitary facilities for all members of the crew who do not occupy rooms to which private facilities are attached shall, wherever practicable, be provided on the following scale:

(a) one shower for every eight persons or less;

(b) one water closet for every eight persons or less; and

(c) one wash basin for every six persons or less.

12.3 Cold fresh water and hot fresh water or means of heating water shall be available in all wash places.

12.4 Wash basins and shower recesses shall be of adequate size and constructed of material with a smooth surface not liable to crack, flake or corrode.

12.5 All water closet spaces shall have independent ventilation to the open air.

12.6 The sanitary equipment to be placed in water closet spaces shall be provided with ample flush of water, available at all times and independently controllable.

12.7 Soil pipes and waste pipes shall be of adequate dimensions and shall be so constructed as to minimise the risk of obstruction and to facilitate cleaning. They shall not pass through fresh water or drinking water tanks, neither shall they, if practicable, pass overhead in mess rooms or sleeping accommodation.

12.8 Sanitary accommodation shall comply with the following requirements:

12.8.1 floors shall be of material that is easily cleaned and impervious to damp, and shall be properly drained;

12.8.2 bulkheads shall be watertight up to at least 200 mm above the level of the deck;

12.8.3 water closet spaces shall not have direct access to spaces where food is stored, prepared or consumed;

12.8.4 water closet spaces shall be situated convenient to but separate from sleeping rooms and shall if practicable be separate from washrooms; and

12.8.5 where there is more than one water closet in a compartment, they shall be sufficiently screened to ensure privacy.

12.9 Facilities for washing and drying clothes shall be provided on a scale appropriate to the number of crew and the normal duration of the voyage.

12.10 The facilities for washing clothes shall include suitable sinks equipped with drainage which may be installed in washrooms if separate laundry accommodation is not reasonably practicable. The sinks shall be provided with an adequate supply of cold fresh water and hot fresh water or means of heating water.

12.1 Where practicable the facilities for drying clothes may be provided in an adequately ventilated compartment separate from sleeping quarters, mess rooms and water closet spaces.

#### 13. Miscellaneous

13.1 Sufficient and adequately ventilated accommodation for the hanging of oilskins shall be provided outside, but convenient to the sleeping rooms.

13.2 Crew accommodation shall be maintained in a clean and habitable condition and shall be kept clear of goods and stores which are not the personal property of the occupants.

## SECTION 7

## LOAD LINES

## Contents

1. This Section is divided into Parts as follows:

- Part 1 : Preliminary (Clause 2)
  - Part 2 : Requirements for Load Line Convention Ships (Clauses 3-4)
  - Part 3 : Requirements for Ships other than Load Line Convention Ships (Clauses 5-14)
  - Part 4 : Appendices
- (sic) → Computation, Conditions of assignment and Deckline marks for vessels less than 24 metres length.

## PART 1—PRELIMINARY

2. This Section should be read in conjunction with the Introduction, Definitions and General Requirements Section.

## SECTION 7

## LOAD LINES

## PART 2—REQUIREMENTS FOR LOAD LINE CONVENTION SHIPS

3. The requirements for determining load lines of Load Line Convention Ships are detailed in the Load Line Convention and the Regulations annexed to that Convention.

4. Load Line Convention Ships shall be surveyed by an Approved Classification Society in accordance with the requirements of the Convention.

## PART 3—REQUIREMENTS FOR SHIPS OTHER THAN LOAD LINE CONVENTION SHIPS

## 5. Interpretation

In this Part unless the context otherwise requires:

- (a) "length" means the length taken as 96% of the total length on a waterline at 85% of the least moulded depth measured from the top of the keel, or as the length from the foreside of the stem to the axis of the rudder stock on that waterline if that be greater. In ships designed with a rake of keel, the waterline on which this length is measured shall be parallel to the designed waterline. Provided that, in a case where no relevant plans of a ship are available, the length may be taken as 91% of the length overall, except in the case of ships of landing craft type when a figure of 88% of the length overall should be used.
- (b) "moulded depth" means the vertical distance measured from the top of the keel to the top of the freeboard deck beams at side. In wood and composite ships 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 ships having rounded gunwales, the moulded depth shall be measured to the point of intersection of the moulded lines of the deck and sides, the lines extending as though the gunwales 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 the moulded depth shall be measured to a line of reference extending from the lower part of the deck along a line parallel with the raised part.

- (c) "Position 1" means a position upon exposed freeboard and raised quarter decks and upon exposed superstructure decks, situated forward of a point located a quarter of the ship's length from the forward perpendicular.
- (d) "Position 2" means a position upon exposed superstructure decks situated abaft a quarter of the ship's length from the forward perpendicular.
- (e) "ship" does not include a ship that is a Load Line Convention ship or a ship in respect of which a valid International Load Line Certificate or an International Load Line Exemption Certificate is in force.

## 6. Freeboard Computation

- (a) Subject to the provisions of clause 14, in the case of a vessel of 24 metres length or more, the freeboard shall be computed in the manner set down in the Load Line Convention.
- (b) Subject to the provisions of clause 14, in the case of a vessel of less than 24 metres length, the freeboard shall be computed in the manner prescribed in Appendix A of this Part.

## 7. Conditions of Assignment

- (a) Subject to the provisions of clause 13, in the case of a vessel of 24 metres length or more, the conditions of assignment of freeboard shall be those set down in the Load Line Convention.
- (b) Subject to the provisions of clause 13, in the case of a vessel of less than 24 metres length, the conditions of assignment of freeboard shall be those conditions prescribed in Appendix B.

## 8. Survey Procedures

- (a) Non-Load Line Convention Ships shall undergo an initial loadline survey to establish the vessel's freeboard and correct marking.
- (b) The freeboard shall be stated on the Survey Certificate.
- (c) Maintenance of the Conditions of Assignment of the loadline shall be ascertained Annually as part of the Annual Survey.
- (d) Where, due to an accident, alteration, or general deterioration of the ship it is considered the existing freeboard may be insufficient; or the owner so requests, a Special Loadline Survey shall be conducted.

## 9. Markings

## 9.1 General requirements for marking.

A ship shall be marked on each side with:

- (a) a deck line mark;
- (b) a load line mark; and
- (c) the mark of the assigning authority

The marks described above are specified in Appendix C.

## 10. Load Line Marks

- (a) The load line mark of a ship shall consist of a ring that is:
- 250 mm in outside diameter;
  - 25 mm in breadth; and
  - intersected by a horizontal line 375 mm in length and 25 mm in breadth, the upper edge of which passes through the centre of ring.
- (b) The centre of the ring referred to in paragraph (a) shall be placed at mid length and at a distance equal to the assigned freeboard, measured vertically below the upper edge of the deck line.

## 11. Mark of assigning authority

- (a) The letters denoting the assigning authority for the load line of a ship shall be marked on the ship on either side of the load line disc, the base of such letters being in line with the horizontal line referred to in paragraph 10(a) (iii)
- (b) The letters referred to in paragraph (a) shall be 100 mm in height and of proportionate breadth.
- (c) Where the assigning Authority is the Fiji Marine Board the marking shall consist of the letter "F", placed to the left hand side of the loadline disc and the letter "M" placed on the right hand side of the loadline disc. The letters shall be 100 mm high, 80 mm wide and 15 mm in thickness.

## 12. Details of marking

The ring and lines referred to in this Sub-Section shall be painted in white or yellow on a dark ground or black on a light ground and shall be permanently marked on the side of the ship in such a manner as to be plainly visible to the satisfaction of the Marine Board

## 13. Modification of requirements for existing ships

In the case of a ship that is an existing ship, the requirements of Sub-Section 8(c) relating to conditions of assignment shall be complied with as far as is in the opinion of the Marine Board, reasonable and practicable having regard to the efficiency of:

- the protection of openings;
- the guard rails and freeing ports; and
- the means of access to crew accommodation, provided by the existing arrangements of the fittings and appliances on the ship.

## 14. Freeboards in existing ships

Where freeboards have been assigned by an approved Authority to a ship that is an existing ship, the ship may retain those freeboard after the date of coming into force of this Section provided that the conditions of assignment maintained in the ship are continued as effective as when the original assignment was made.

## PART 4—APPENDICES

Appendix A—Computation of freeboard for vessels less than 24 metres in length.

Appendix B—Conditions of assignment for vessels less than 24 metres in length.

Appendix C—Deck Line Marks, Load Line Marks and Marks of the Fiji Marine Board.

## APPENDIX A

## COMPUTATION OF FREEBOARD FOR VESSELS LESS THAN 24 METRES IN LENGTH

- For all vessels having a continuous watertight deck and where hatchways are secured watertight by steel covers or equivalent means: 200 millimetres.
- For all vessels having a continuous watertight deck and where hatchways are secured watertight by wooden boards and tarpaulins 250 millimetres.
- For vessels which are open or only partly decked:

Length	Freeboard
10 metres and over.....	500 millimetres
6 metres or less.....	400 millimetres

Freeboard for intermediate lengths are to be obtained by linear interpolation.

## 4. Additional freeboard for vessels licenced to carry passengers

4.1 In addition to the freeboard assigned in clauses 1, 2 or 3 to the vessel shall, if necessary, be increased to such that, if all the passengers the vessel is licenced to carry are placed on one extreme side of the vessel on the uppermost deck, while the vessel is in its fully loaded condition, the resultant list shall not submerge the loadline more than 50% of such freeboard assigned.

For this purpose it is assumed 13.6 persons to weigh one ton.

## APPENDIX B

## CONDITIONS OF ASSIGNMENT FOR VESSELS LESS THAN 24 METRES IN LENGTH

## 1. Sill Height

1.1 The height above deck of sills in doorways of deckhouses shall comply with the following:

1.1.1 The height above the deck of sills in doorways of deckhouses or superstructures on the weather deck from inside which there is direct access to spaces below the weather deck shall not be less than 300 mm.

1.1.2 The height above the deck of sills in doorways of deckhouses, or companionways on the weather deck which are shielded from the full force of the sea, except those giving direct access to machinery spaces, shall be not less than 150 mm.

## 2. Hatch Coamings of Standard Height

The coamings of hatchways in Position 1 and Position 2 shall be of substantial construction. The height above deck of coamings in Position 1 and Position 2 shall be not less than 450 mm and 300 mm respectively.

## 3. Hatch Coamings of Reduced or No Height

Where hatches situated within the mid half beam of the vessel are of a width less than half the beam of the vessel, are closed with efficient weathertight covers of steel or other equivalent materials fitted with gaskets and clamping devices and are cap-

able of being rapidly closed and battened down and the Marine Board is satisfied that the safety of the vessel in the service sea conditions will not be impaired by so doing, the Marine Board may:

- (a) determine that the coamings of these hatchways shall be of a height less than that specified above; or
- (b) determine that the coamings for these hatchways be omitted.

and in such a case the coamings shall be of the height so specified or the coamings may be omitted.

#### 4. Scuppers and Discharges

Scuppers and discharge pipes which pass through the side of the vessel shall comply with the following:

- (a) scupper and discharge pipes, excluding machinery exhaust an easily accessible position against the vessel's side, except that where approved bilge alarms are fitted, such valves or cocks shall not be required in the case of discharges not exceeding 40 mm internal diameter, the lowest point of which is not less than 225 mm above the load waterline. Waste and soil discharges greater than 40 mm internal diameter from spaces above the freeboard deck which are led through the vessel's side more than 225 mm above the summer load waterline may be fitted with a non-return valve in lieu of a screw-down valve or cock.
- (b) Main propulsion machinery exhaust systems shall be fitted with an approved hull fitting, the lower edge of which shall be as high as practicable but not less than 225 mm above the summer load waterline. Such systems may pass through watertight bulkheads aft of the machinery space provided that:
  - (i) an afterpeak bulkhead is fitted extending to the weather deck;
  - (ii) the system is passed through the bulkhead or bulkheads as close to the underside of the weather deck as practicable; and
  - (iii) an approved bulkhead fitting is provided at each watertight bulkhead through which the system passes.
- (c) Auxiliary machinery exhaust systems shall comply with the provisions of sub-paragraph 4(b)(i) above shall not pass through watertight bulkheads without the approval of the Marine Board.

#### 5. Freeing Ports

5.1 Where bulkwarks in the weather portion of a freeboard deck form wells, there shall be provided, on each side of the vessel, in each well a minimum freeing port area having the same number of square metres as the number obtained as follows:

- (a) Where the length of the well is 20 metres or greater, from the formula:  
Freeing port area =  $0.07 g$   
Where  $g$  = length of well in metres; or
- (b) Where the length of the well is less than 20 metres, from the following table:

Length of Well (Metres)	Freeing Port Area (Each bulwark, Square Metres)
2.5	0.28
5.0	0.52
7.5	0.76
10.0	1.00
12.5	1.07
15.0	1.21

The freeing port area for intermediate lengths of well may be determined by interpolation.

5.2 Where the average height of bulwark exceeds 1.2 metres, the area obtained in accordance with the provisions of sub-item 5.1 shall be increased by the number of square metres ascertained from the formula:  $0.04 gh$

5.3 Where the average height of bulwark is less than 0.9 metres, the area obtained in accordance with the provisions of sub-item 5.1 shall be reduced by the number of square metres ascertained from the formula:  $0.04 gh_2$

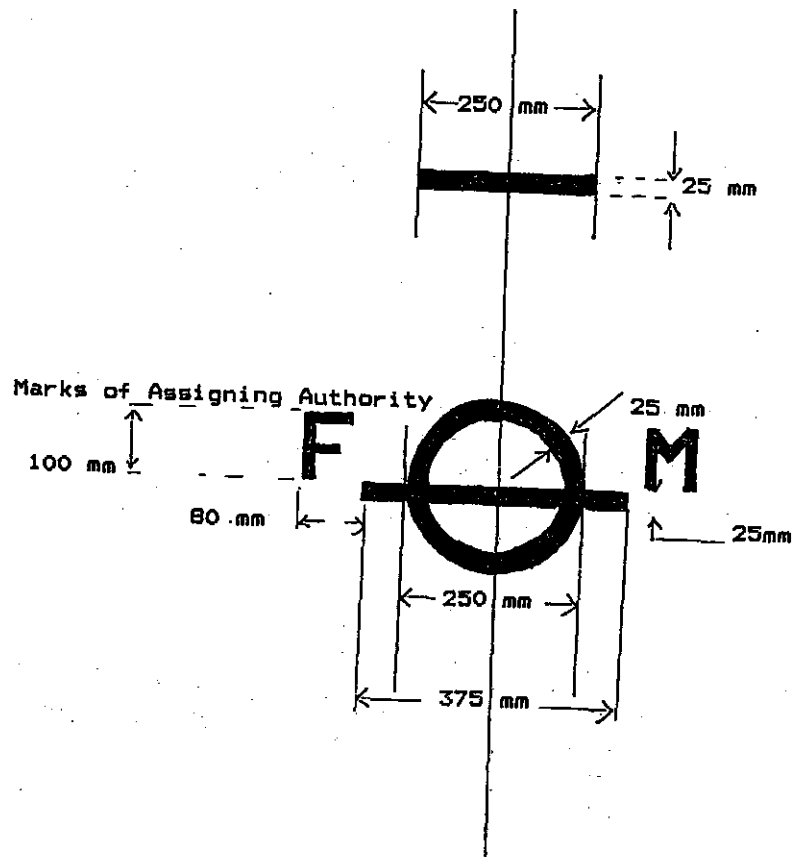
5.4 For the purposes of sub-items 5.2 and 5.3:

- $g$  = length of the bulwark in the well;  
 $h$  = the difference in metres between the average height of the bulwark in the well and 1.2 metres; and  
 $h_2$  = the difference in metres between the average height of the bulwark in the well and 0.9 metres.

#### 6. Air Pipes and Ventilator Coamings

The heights of air pipes and ventilator coamings in Position 1 and Position 2 shall be not less than 450 mm and 300 mm respectively.

## APPENDIX C

DECK LINE MARKS, LOAD LINE MARKS  
AND MARKS OF FIJI MARINE BOARD

## Section 7

## SECTION 8

## TONNAGE MEASUREMENT

## CONTENTS

1. This Section is divided into Parts as follows:

- Part 1 : Preliminary
- Part 2 : Tonnage Measurement Convention
- Part 3 : Vessels to which the tonnage convention does not apply
- Part 4 : Tonnage certificates

## PART 1—PRELIMINARY

2. This Section should be read in conjunction with the Introduction, Definitions and General Requirements Section.

## PART 2—TONNAGE MEASUREMENT CONVENTION

3. Vessels to which the Tonnage Measurement Convention applies shall have their tonnage determined according to that convention.

PART 3—VESSELS TO WHICH THE TONNAGE MEASUREMENT  
CONVENTION DOES NOT APPLY

4. Vessels to which the Tonnage Measurement Convention does not apply shall have their tonnage determined according to that convention, subject to the following:

4.1 Vessels of less than 24 metres length shall have their gross tonnage determined according to the formula:

$$\text{Gross tonnage} = 0.24 (0.6 \text{LBD} + \text{VgA})$$

- Where L = Length in Metres on upperdeck from stem to rear stern profiles;
- B = Maximum breadth in Metres measured to the outer surface of the hull;
- D = Moulded depth in Metres at half of the length measured from the top of the keel up to the underside of the upperdeck including round of beam at the middle plane;
- VgA = Volume in Cubic Metres of closed structures, deckhouses and other main bodies

4.2 Vessels of less than 10 metres length shall not be required to have their tonnage determined, but when the owner so requests, a tonnage may be determined in accordance with this Part.

4.3 In respect of existing vessels Article 3 of the Convention shall apply. The Convention came into force in respect of Fiji on 18th July 1982.

Paragraph (2)(d) of Article 3 of the Convention shall come into effect in respect of Fiji on 18th July 1994.

PART 4—TONNAGE CERTIFICATES

5. The following forms are the certificates which shall be issued:

Form TM1—INTERNATIONAL TONNAGE CERTIFICATE (1969) to vessels to which the Tonnage Convention applies;

Form TM2—FIJI MARINE BOARD TONNAGE CERTIFICATE to vessels to which the Tonnage Convention does not apply.

FIJI CERTIFICATE FORM TM1  
(Seal) INTERNATIONAL TONNAGE CERTIFICATE (1969)

Issued under the provisions of the International Convention on Tonnage Measurement of Ships, 1969, under the authority of the Government of FIJI for which the Convention came into force on 18th JULY, 1982 by the FIJI MARINE BOARD.

Name of Ship	Distinctive Number or Letters	Port of Registry	* Date

\* Date on which the keel was laid or the ship was at a similar stage of construction (Article 2(6), or date on which the ship underwent alterations or modifications of a major character (Article 3(2)(b), as appropriate.

MAIN DIMENSIONS

Length (Article 2(8))	Breadth (Regulation 2(3))	Moulded Depth amidships to Upper Deck (Regulation 2(2))

THE TONNAGES OF THE SHIP ARE:

GROSS TONNAGE \_\_\_\_\_

NET TONNAGE \_\_\_\_\_

This is to certify that the tonnages of this ship have been determined in accordance with the provisions of the International Convention of Tonnage Measurement of Ships, 1969.

Issued at \_\_\_\_\_ 19 \_\_\_\_\_  
(place of issue of certificate) (date of issue)

\_\_\_\_\_  
(signature of the President, FIJI MARINE BOARD  
and/or  
(seal of FIJI MARINE BOARD)

If signed, the following paragraph is to be added:  
The undersigned declares that he is duly authorized by \_\_\_\_\_ said Government to issue this certificate.

(Signature) \_\_\_\_\_

SPACES INCLUDED IN TONNAGE

GROSS TONNAGE:			NET TONNAGE:		
Name of Space	Location	Length	Name of Space	Location	Length
Underdeck					
			<b>NUMBER OF PASSENGERS</b> (Regulation 4(1))  Number of passengers in cabins with not more than 8 berths _____  Number of other passengers _____		
<b>EXCLUDED SPACES</b> (Regulation 2(5))  An asterisk (*) should be added to those spaces listed above which comprise both enclosed and excluded spaces.			<b>MOULDED DRAUGHT</b> (Regulation 4(2))		

Date and place of original measurement \_\_\_\_\_

Date and place of last previous remeasurement \_\_\_\_\_

REMARKS:



FIJI  
(Seal)

CERTIFICATE

FIJI MARINE BOARD TONNAGE CERTIFICATE

Issued under the provisions of Section 21 of the Marine Act, 1986.

Name of Ship	Distinctive Number or Letters	Port of Registry	* Date

\* Date on which the keel was laid or the ship was at a similar stage of construction or date on which the ship underwent alterations or modifications of a major character as appropriate.

MAIN DIMENSIONS

Length	Breadth	Moulded Depth admships to Upper Deck

THE TONNAGES OF THE SHIP ARE:

GROSS TONNAGE \_\_\_\_\_

NET TONNAGE \_\_\_\_\_

This is to certify that the tonnages of this ship have been determined in accordance with the provisions of Section 21 of the Marine Act, 1986.

Issued at \_\_\_\_\_ 19\_\_\_\_  
(place of issue of certificate) (date of issue)

\_\_\_\_\_  
(signature of the President, FIJI MARINE BOARD)

(Seal of  
FIJI MARINE BOARD)

If signed, the following paragraph is to be added:

The undersigned declares that he is duly authorized by the said Government to issue this certificate.

(Signature) \_\_\_\_\_

SPACES INCLUDED IN TONNAGE					
GROSS TONNAGE:			NET TONNAGE:		
Name of Space	Location	Length	Name of Space	Location	Length
Underdeck					
			NUMBER OF PASSENGERS		
			Number of passengers in cabins with not more than 8 berths _____		
			Number of other passengers _____		
EXCLUDED SPACES			MOULDED DRAUGHT		
An asterisk (*) should be added to those spaces listed above which comprise both enclosed and excluded spaces.					

Date and place of original measurement \_\_\_\_\_

Date and place of last previous remeasurement \_\_\_\_\_

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## ENGINEERING

## PART 1—PRELIMINARY

1. This section is divided into Parts as follows:

Part 1	Preliminary
Part 2	General
Part 3	Machinery
Part 4	Electrical
Part 5	Liquid Petroleum Gas Installation
Part 6	Cargo Refrigeration
Part 7	Personnel Protection

2. This Section should be read in conjunction with the Introduction, Definitions and General requirements Section.

3. Application

3.1 Subject to sub clause 3.2 these requirements shall be applicable to all classes of vessels less than 35m in length.

3.2 Vessels of 35m in length and over shall comply with Parts 2, 5 and 7 and Clause 29 of Part 4 of this section and shall otherwise be assessed under the Rules of an approved Classification Society. Additionally Safety Convention Ships shall comply with the Safety Convention.

3.3 In the case of a ship other than a Safety Convention Ship that is an existing ship the Fiji Marine Board may permit such modifications to the requirements of this Section as it thinks fit, having regard to:

- (a) the Age of the ship; and
- (b) the trade in which the ship is, or is about to be engaged.

## PART 2—GENERAL

4. In this Section the following requirements shall apply:

4.1 Design—Corrosion and Abnormal Loadings

4.1.1 Where any item detailed in this Section is subject to rapid corrosion, other rapid form of deterioration or to abnormal loading, such item shall be subject to special consideration.

4.1.2 In any pipe system provision shall be made to avoid excessive stress in any part due to expansion and contraction resulting from variation in temperature or due to vibration and shall otherwise take account of the effects of corrosion and external mechanical damage.

4.2 Novel Design and Unusual Materials

Where any item detailed in this Section is novel in design, or involves the use of unusual materials, the owner or his agent shall submit full calculations and any other information required. He shall bear the cost of any special tests or examinations considered necessary by the Fiji Marine Board.

4.3 Astern Power

Where the shaft power available for propulsion exceeds 5kW astern power shall be provided for adequate manoeuvrability under normal operating conditions.

4.4 Access to Machinery

The overall design of a machinery space shall be so arranged as to permit reasonable access to all items of the installation which may require attention; in service.

4.5 Machinery Identification

4.5.1 All controls for operating the machinery, and all measuring devices, pumping systems, valves, cocks, air pipes, sounding pipes, switches etc. shall be permanently marked with appropriate inscriptions clearly showing their purpose. All hand-wheels for valves which are closed by turning anti-clockwise shall be marked to show the direction of turning for closure. Where pipes are marked by colours to indicate their purpose the colours shall be in accordance with Australian Standard AS 1345.

4.5.2 The provisions of this sub-clause need not apply if the surveyor considers it to be unnecessary owing to the simplicity of the installation.

4.6 Manufacturer's Recommendations

In all requirements of this Section due consideration shall be given to any specific recommendations of the manufacturer of any engine or item of ancillary equipment.

4.7 Other Sections

In addition to a requirement of this Section there may be associated requirements in the Load Lines, Construction, Fire Appliances, Life-saving Appliances and other Sections of these uniform requirements. Due regard shall therefore be paid to these requirements.

4.8 Communication

A vessel of 24.4m and over shall be provided with a suitable means of communication between the wheelhouse and the machinery space except that this shall not apply in the case of a vessel having propulsion machinery which under normal operating conditions is started, controlled and stopped from the wheelhouse only.

## PART 3—MACHINERY

5. Main Engines

5.1 Subject to the next succeeding sub-clause of this clause, a vessel shall be provided with a main engine or engines of a type designed and manufactured for marine use having regard to their intended purpose and shall operate on fuel having a closed flash point of not less than 60°C.

5.2 Engines which operate on fuel having a closed flash point of less than 60°C may only be used on vessels of less than 10 m in length in outboard engines in Classes 3D and 3E vessels.

6. Machinery Seatings

6.1 General

Each item of machinery shall be securely bolted to a rigid seating. Fitted and/or clearance bolts shall be used and suitable arrangements are to be provided to prevent the bolts from becoming slack.

## 6.2 Wood and Glass Reinforced Plastic (GRP)

Where the machinery seatings are of wood or GRP the upper face of recesses to accommodate the nuts and washers of the holding down bolts are to be located at a depth, below the upper face of the seating, sufficient to ensure ample material in compression when the bolts are tightened.

## 6.3 Resilient Mountings

When resilient mountings are fitted the output shaft is to be connected to a flexible coupling. Satisfactory arrangements are to be made to transmit thrust.

## 7. Instrumentation

### 7.1 Instruments—General

Instruments shall be suitable for marine use, capable of withstanding vibration and shock and be so installed and illuminated as to be readily visible.

### 7.2 Items Monitored

7.2.1 An engine essential for the safe operation of a vessel of 25m in length and over shall be provided with an audible warning device to indicate a dangerous condition associated with:

- (a) engine lubricating oil pressure;
- (b) engine jacket cooling water outlet temperature; and
- (c) engine gear box lubricating oil pressure.

7.2.2 All engines essential for the safe operation of the vessel shall, to the extent that the design and manufacture allows, be provided with instruments indicating the following:

- (a) engine lubricating oil pressure;
- (b) engine jacket cooling water outlet temperature;
- (c) engine gear box lubricating oil pressure;
- (d) charging rate of generator; and
- (e) in the case of propulsion machinery, the rotational speed.

### 7.3 Unmanned Machinery Space

In the case of an unmanned machinery space the instruments as required by sub-paragraph 7.2.2(a)(b) and (c) shall be located as to be clearly visible at each steering position. The instruments required by sub-paragraph 7.2.2(d) and (e) shall only be necessary at the position at which the vessel is principally navigated.

## 8. Starting Arrangements

### 8.1 Methods

In all Class 1, 2A, 2B & 2C vessels where the main engine or engines are not fitted with hand starting arrangements, provision shall be made for an alternative method of starting to be capable of being developed on board without external aid. If for this purpose:

- (a) an electric generator or air compressor is required, the unit shall be power driven by a hand starting engine. A hand operated air compressor may be accepted and in the case of electric starting a standby set of batteries may be accepted.
- (b) a hydraulic accumulator is required, then the accumulator shall be capable of being pressurised by hand.

### 8.2 Number of Starts

Air receivers or batteries used for starting main engines shall have sufficient capacity without recharging to provide:

- (a) 6 consecutive starts for each non-reversible engine.
- (b) 12 consecutive starts for each reversible engine

## 8.3 Bars and Hand Cranks

Bars used on flywheels to turn machinery over by hand shall be so constructed as to facilitate easy withdrawal from the flywheel's recess if the engine should recoil. Hand cranks for engines shall be designed to disengage instantly when the engine starts.

## 9. Unfired Pressure Vessels

9.1 Unfired pressure vessels and their mountings shall be designed, constructed and tested in accordance with the requirements of Australian Standard AS 1210 or the requirements of a classification society.

## 10. Exhaust Systems

### 10.1 Gas Passage Area

No part of the exhaust gas passage shall have an area less than that of the outlet of the exhaust manifold. If the exhaust system is unusually long or the conditions require bend, the internal cross sectional area of the piping shall be increased to prevent an increase of back pressure at the engine.

### 10.2 Separation

Exhaust pipes of several engines shall not be connected together but shall be run separately to the atmosphere unless arranged to prevent the return of gases to an idle engine.

### 10.3 Silencer

All internal combustion engines, shall be effectively silenced.

### 10.4 Materials

Exhaust pipes and silencers shall be of steel, copper or other approved material.

The use of reinforced synthetic rubber hose may be permitted for exhaust pipes on engines having water cooled exhausts. Except for reinforced synthetic rubber hose enclosed in a gastight trunk as required by sub-clause 10.8, all of the hose shall be readily visible.

### 10.5 Thermal Protection

Exhaust piping and silencers are to be water cooled or efficiently lagged. The exhaust system is to be so installed as to prevent the transfer of heat to readily combustible materials.

### 10.6 Height of Discharge

Exhaust pipe discharges which are led through the hull below deck level are to be installed as high above the load water line as practicable and shall not be installed at a height less than the height required by the Load Line or Construction Sections of these uniform requirements, as is applicable. The arrangement shall otherwise comply with the relevant provisions of the Load Lines Section.

### 10.7 Back Flooding

The exhaust system shall be so designed and installed as to prevent sea water or exhaust cooling water entering the engine manifold.

### 10.8 Protection of Accommodation Space

An exhaust pipe which passes through an accommodation space shall be enclosed in a gas tight trunking.

### 10.9 Location of Discharge

Where an exhaust pipe is led above the deck it shall be installed well clear of space openings so as to limit the products of combustion passing back into any space in the vessel.

### 10.10 Layout—Support

Exhaust pipes shall be led to the point of escape with a minimum number of bends or elbows and be adequately supported.

## 11. Engine Cooling Systems

### 11.1 Air Cooling

11.1.1 In air cooled engines the cooling air discharge shall be separately trunked to the open air.

### 11.2 Water Cooling

11.2.1 In water cooled engines an adequate supply of sea water shall be provided for cooling purposes.

11.2.2 A cooling water pump may be driven by the engine it serves or be independently driven.

11.2.3 In vessels propelled by a single main engine exceeding 400 kW brake power, provision is to be made for an emergency supply of cooling water from a separate power pump which may be driven by the engine.

## 12. Ventilation of Machinery Spaces

### 12.1 Aspiration

Adequate ventilation shall be provided in the engine room and all other enclosed machinery spaces. The volume of air provided shall be not less than that necessary for the efficient aspiration and efficient operation of the main engines and other machinery. Such ventilation shall be obtained with all access openings closed.

### 12.2 Ventilator Sizes for Natural Ventilation

The engine room shall be furnished with an inlet and exhaust ventilator each of which is to have a minimum size as follows:

vessels less than 10 m in length .	100 cm <sup>2</sup>
vessels of 10 m and over but less than 15 m in length .	160 cm <sup>2</sup>
vessels of 15 m and over but less than 20 m in length .	220 cm <sup>2</sup>
vessels of 20 m and over but less than 25 m in length .	280 cm <sup>2</sup>
vessels of 25 m and over but less than 30 m in length .	340 cm <sup>2</sup>
vessels of 30 m and over but less than 35 m in length .	400 cm <sup>2</sup>

### 12.3 Area of Cowls or Scoops

Where cowls or scoops are provided on any ventilator, the free area of the cowl or scoop shall be not less than twice the required trunk area. Where the cowls or scoops are screened, the mouth area shall be increased to compensate for the area of the screen wire. Inlet and outlet openings shall not be located where the natural flow of air is obstructed. Outlet ventilators shall not discharge within one metre of a possible source of ignition. Ventilators shall be so located that exhaust air will not be taken into supply vents.

## 13. Gear Boxes

13.1 Gear boxes shall be of the marine type and suitably matched to the prime mover with which they are to be used. When coupled to the engine it shall not be possible to exceed the limiting power, torque, speed or thrust of any component of the gear box. Maker's certificates covering design, material and manufacture may be accepted for this purpose.

## 14. Propeller and Intermediate Shafting

### 14.1 Intermediate Shaft Size

The diameter of the intermediate shafting shall not be less than that determined by the following formula:

$$d_i = akf \sqrt[3]{\frac{P}{N}}$$

where d = diameter of intermediate shafting in mm

a = 1.108 for vessels of Classes 1, 2, 3A and 3B

= 1.053 for vessels of Classes 3D and 3E

k = 89 for propulsion through reduction gears or flexible couplings

= coefficient given in table 14.1A for propulsion by direct drive in line engines

P = the greater of

(a) the maximum continuous brake power in kW; or

(b) the maximum brake power in kW the engine when installed will transmit irrespective of the time the engine manufacturer nominates the engine may be run at that power

f = shaft revolutions per minute

f = steel factor to be determined by formula

$$f = 1.01 \sqrt[3]{\frac{400}{T}}$$

where T is the minimum ultimate tensile strength of the shaft material in MPa Note: Where test pieces are not submitted the value of T shall be the minimum ultimate tensile strength of the material as guaranteed by the manufacturer and for low carbon steel it shall be taken as 410 MPa for 316 stainless steel 618 MPa and for 329 stainless steel 724 MPa.

TABLE 14.1A

No. of cylinders	2 S.C.	4 S.C.
	k	k
1 & 2	114	109
3	107	109
4	102	109
5	99	105
6	96.5	102
7	95	101
8	93	99
9	90	98
10	90	94
11 and more	90	90

### 14.2 Propeller Shaft Size

The diameter of the propeller shaft shall not be less than that determined by the following formula:

$$d_p = (1.14 d_i \frac{d}{K}) f$$

where  $d_p$  = diameter of propeller shaft in mm

$d_i$  = diameter of intermediate shaft in mm  
(calculated for a material with a U.T.S. of 410 MPa)

$d$  = propeller diameter in mm

$K$  = 144 for shafts protected against corrosion by

- a continuous liner;
- a suitable oil gland;
- an appropriate coating of the shaft between bushes, if this coating can be examined at each dry docking; or
- the nature of the material of the shaft

$K$  = 100 in all other cases

$f$  = steel factor to be determined by formula

$$f = 1.01 \sqrt[3]{\frac{400}{T}}$$

where  $T$  is the minimum ultimate tensile strength of the shaft material in MPa.

NOTE: Where test pieces are not submitted the value of  $T$  shall be the minimum ultimate tensile strength of the material as guaranteed by the manufacturer and for low carbon steel it shall be taken as 410 MPa, for 316 stainless steel 618 MPa and for 329 stainless steel 724 MPa.

The part of the propeller shaft forward of the stern gland may be tapered down to a diameter calculated in accordance with the following formula:

$$\text{Reduced diameter} = 1.14 (d_i \times \frac{f_p}{f})$$

where  $f_p$  is the steel factor used for calculating  $d_p$  and  $f_i$  is the steel factor used in calculating  $d_i$ . The reduction in diameter is to be as gradual as possible.

### 14.3 Hollow Shafting

Where hollow shafting is used, the proportions are to be such that the strength will be equivalent to that required for the corresponding solid shaft, except that a central hole not exceeding one third of the shaft diameter may be accepted without increase in shafts size.

### 14.4 Bearing Spacing

Any unsupported length of shafting shall not exceed that determined by the following formula:

$$S = 0.142 \sqrt[3]{d^2}$$

where  $S$  = distance between bearing in mm  
 $d$  = diameter of shaft in mm

The forward most bearing should preferably be at least 12 shaft diameters from the engine gear box or thrust block flange.

### 14.5 Propeller Shaft Overhang

The overhang of the propeller shaft between the forward face of the propeller boss and the after face of the adjoining shaft bearing shall not be more than the actual propeller shaft diameter. However an overhang greater than this amount may be permitted provided that the bending stress due to the additional overhang is considered in the calculation of the shaft diameter.

### 14.6 Material

#### 14.6.1 Shafts shall be of

- salt water resistant stainless steel
- bronze
- monel metal
- fully killed carbon steel for diameters of 150 mms and over; or
- semi-killed carbon steel for diameters less than 150 mms.

The use of rimming of free cutting steel is not acceptable.

#### 14.6.2 Shafts shall conform to the following minimum requirements:

- ultimate tensile strength (U.T.S.) 410 MPa
- yield point 230 MPa
- elongation
  - bronze 25%
  - carbon steel 23%
  - monel 20%
  - stainless steel 17%

The Board shall be satisfied that the material is suitable for the purpose and where doubt exists may require physical and/or chemical tests to be conducted. Where tests are required to determine the U.T.S. and elongation they shall be determined on a 70 mm minimum gauge length by 14 mm diameter test piece.

Screw shafts and tube shafts of carbon or carbon manganese steel are in general to be restricted to a range of tensile strength between 410 and 510 MPa.

Where it is proposed to use:

- a carbon or carbon manganese steel having a specified minimum tensile strength greater than 590 MPa; or
- a material other than carbon or carbon manganese steel having a minimum tensile strength greater than 724 MPa.

full details shall be submitted to the Fiji Marine Board for consideration.

### 14.7 Propeller Shaft Liner

14.7.1 Propeller shafts of carbon steel are to be protected by a continuous salt water resistant liner where exposed to sea water. Alternatively, the liner may be omitted provided the shaft runs in an oil lubricated stern tube with an approved sealing gland at the after end. Lengths of shafting between stern tubes and propeller brackets may be protected by suitable coatings.

14.7.2 The thickness of bronze liners fitted on propeller shafts or tube shafts in way of the bushes shall not be less than

$$t = \frac{d_p + 230}{32}$$

where  $t$  = thickness of liner in mm

$d_p$  = diameter required for the propeller or tube shaft within the liner in mm

The thickness of a continuous liner at the part between the bushes shall not be less than 0.75 t. Liners shall be shrunk on or forced on to the shafts by hydraulic pressure. Securing pins shall not be fitted.

14.7.3 The thickness of stainless steel or mild steel liners fitted on propeller shafts or tube shafts in way of the bushes shall not be less than:

$$t = \frac{d_p + 120}{32}$$

where t = thickness of the liner in mm

$d_p$  = diameter required for the propeller or tube shaft within the liner in mm

Liners shall be either shrunk on, or forced on to the shafts by hydraulic pressure. Securing pins shall not be fitted.

14.7.4 Effective means shall be provided to exclude water from the part of the shaft between the after end of the liner and the propeller boss. Any cavity between the liner and the shaft clear of the close fitting portions shall be filled with a suitable composition.

#### 14.8 Propeller Shaft Taper

Propeller shafts are to be provided with an accurate taper fit in the propeller boss, particular attention being given to the fit at the large end of the taper. The taper shall be between the limits of 1 in 12 and 1 in 16 on the diameter. It is recommended that the 1 in 12 taper be employed wherever possible.

#### 14.9 Keys and Keyways

14.9.1 Keyways are to be contained wholly within the length of the taper. The distance between the large end of the taper and the commencement of the keyway is to be not less than 0.2 of the nominal diameter of the propeller shaft. The depth of the keyway shall be half the required thickness of the key.

14.9.2 Keyways are to be provided with smooth fillets at the bottom and sharp edges at the top are to be removed. For shafts in excess of 150 mm nominal diameter, the radius of the fillet in the bottom corners of the keyways is to be at least 0.012 of the nominal diameter of the shaft.

14.9.3 Keys for propeller shafting are to be of the round ended or sled-runner type, and shall be of material similar to the shaft to which they are to be fitted.

Where keys of the sled-runner type are used provision should be made to prevent them from sliding in the keyway.

14.9.4 The dimensions of keys are to be determined in accordance with the following formula:

$$w = \frac{d_p}{4} \text{ mm}$$

t (for shafts less than 150 mm dia)

$$= 0.633(w-8) + 6 \text{ mm}$$

t (for shafts equal to or greater than 150 mm dia) =  $w + 6$  mm

where  $d_p$  = diameter of propeller shaft in mm

w = width of key in mm

t = thickness of key in mm

The length of the key (L) in mm is to be not less than

$$L = \frac{d_p^2}{2.5 w} \text{ mm}$$

Where  $d_p$  = nominal diameter of the propeller shaft in mm.

#### 14.10 Propeller and Shaft Coupling Retaining Nuts

14.10.1 Retaining nuts which are of similar materials to the propeller or intermediate shafting to which they are to be fitted shall comply with the following:

- the outside diameter of the threads shall be not less than 0.75 of the diameter at the small end of the taper;
- the depth over which the nut is fully threaded shall not be less than 0.75 of the diameter of the thread; and
- the width across the flats or the effective outside diameter shall not be less than 1.5 times the diameter of the thread.

The nuts shall be fitted with effective locking devices. Propeller nuts fitted to low carbon steel shafts shall be cap nuts.

14.10.2 The pitch of the threads for shafts and nuts should be in accordance with the following:

- 2.5 mm pitch for diameters not exceeding 40 mm;
- 3.5 mm pitch for diameters of 40 mm and not exceeding 75 mm;
- 4 mm pitch for diameters of 75 mm and not exceeding 100 mm; and
- 6 mm pitch for diameters exceeding 100 mm.

The tread form should be U.N.C.

#### 14.11 Coupling Materials

Couplings are to be of carbon steel or equivalent material. Ordinary grades of cast iron will not be accepted and higher grades will be subject to special consideration.

#### 14.12 Coupling Types

Couplings shall be of the following types:

- Flange couplings with flanges formed by upsetting the ends of a shaft,
- Flange couplings with flanges of fabricated construction. Such couplings shall be suitably designed, prepared, and heat treated subsequent to welding and then machined. They shall be subjected to such testing as is deemed necessary.
- Coupling fitted on a taper, keyed and held in place with a nut.
- Couplings shrunk on a parallel shaft which do not employ a key, pin, dowel or similar item in way of the shrink fit provided that the design and manufacture satisfactory and the couplings are not subject to removal in service.
- Oil injection couplings
- Couplings of the split type, keyed and clamped to parallel shafts
- Approved flexible couplings

#### 14.13 Coupling Dimensions

The thickness of a coupling flange shall be not less than 0.25 of the diameter of the intermediate shaft or shall be equal to the diameter of the coupling bolt whichever is the greater.

The ligament thickness outside the coupling bolt holes shall be not less than 0.6 of the coupling bolt diameter.



The fillet radius at the base of the flange is to be not less than 0.125 of the actual diameter of the shaft. The strength of the boss of a coupling shall be not less than the equivalent strength of the shaft.

#### 14.14 Universal Joint Couplings

Universal joints may be incorporated in the propulsion shafting between the engine and thrust block.

The hollow shafting component of such a universal jointed propulsion shafting installation shall be equivalent to the requirements of the clause which relates to solid propeller shafting, and the flanged universal ends shall be equivalent to the requirements which relate to couplings.

The installation shall be such as to limit the stresses set up by cyclic irregularities.

Effective arrangements are to be provided to prevent damage to the hull or structure of the vessel due to the flailing of the shaft should the universal joint elements fail to service.

#### 14.15 Shaft Coupling Bolts

14.15.1 The minimum diameter of the shaft coupling bolts is to be determined by the following formula:

$$d_b = 0.54 \sqrt{\frac{d^3}{Nr}}$$

where  $d_b$  = diameter of bolts at joint in mm

$N$  = number of bolts fitted in one coupling

$r$  = pitch circle radius of bolts in mm

$d$  = required diameter of intermediate shaft in mm, using material having the same mechanical properties as the material of the coupling bolts.

14.15.2 Shaft coupling bolts shall be machine finished and neat fitting.

#### 14.16 Bolts for Clamp Coupling

14.16.1 The diameter at the bottom of the threads of bolts in clamp coupling is not to be less than:

$$d_b = 3.3 \sqrt{\frac{d_i^3}{Nr}}$$

where  $d_b$  = diameter of bolts in mm

$N$  = number of clamp bolts at one of the shaft ends

$r$  = distance in mm between the centre of the bolts and the centre line of the shaft

$d_i$  = required diameter of intermediate shaft in mm, using material having the same mechanical properties as the material of the coupling bolts.

14.16.2 A minimum of two bolts shall be let into the shaft for half their diameter, to take the astern thrust.

#### 14.17 Stern Bearings

14.17.1 Grease lubricated white metal bearings, or water lubricated bearings which are lined with rubber composition or other suitable material, shall not be less in length than four times the diameter of the propeller shaft

14.17.2 Oil lubricated white metal bearings shall be provided with a satisfactory type of oil sealing gland. The length of the bearing is to be sufficient to ensure that the bearing pressure resulting from the mass of the propeller and propeller shafting will not exceed 480 kPa. The length of the bearing shall not be less than 2 times the diameter of the propeller shaft.

#### 14.18. Flexible Stern Gland

In the case of a vessel of less than 10 m in length, any Class 2 or any Class 3 vessel in which the screw or tube shaft is not greater than 60 mm in diameter, a flexible stern gland may be fitted. The gland shall be connected to the stern tube by approved reinforced synthetic rubber hose and the hose shall be secured by two corrosion resistant clips at each end. Circular movements of the gland shall be limited by stops to not more than 5° either side of the mean position.

#### 14.19 Propeller Shaft Brackets

##### 14.19.1 General

Unless otherwise provided, reference to diameter of propeller shaft in this sub-clause shall mean the diameter of the propeller shaft as provided for the vessel.

##### 14.19.2 Boss

The length of the boss is to be not less than four times the diameter of the propeller shaft. The thickness of the boss is to be not less than one quarter of the diameter of the propeller shaft.

##### 14.19.3 Brackets of 'V' Configuration of Carbon Steel

###### 14.19.3.1. Width

The width of each leg is not to be less than that obtained from the following formula:

$$W = 2.27d$$

where

$W$  = width of major axis in mm

$d$  = diameter of propeller shaft in mm, calculated for a material having a U.T.S. of 410 MPa

###### 14.19.3.2 Thickness

The thickness of each leg is not to be less than that obtained from the following formula:

$$t = 0.35d$$

where

$t$  = thickness of leg (minor axis) in mm

$d$  = diameter of propeller shaft in mm, calculated for a material having a U.T.S. of 410 MPa.

Where the included angle between the legs is less than 45° the scantlings are to be specially considered.

##### 14.19.4 Brackets of 'T' Configuration of Carbon Steel

###### 14.19.4.1 Width

The width of the leg is not to be less than that obtained from the following formula:

$$W_i = 3.22d$$

where

$W_i$  = width of major axis in mm

$d$  = diameter of propeller shaft in mm, calculated for a material having a U.T.S. of 410 MPa.

## 14.19.4.2 Thickness

The thickness of the leg is not less than that obtained from whichever of the following formula is appropriate:

(a) where the bracket is a cantilever

$$t_i = 0.515d; \text{ or}$$

(b) where the lower end of the bracket is attached to a shoe piece or skeg

$$t_i = 0.036d$$

and  $t_i$  = thickness of the leg (minor axis) in mm

$d$  = diameter of propeller shaft in mm, calculated for a material having a U.T.S. of 410 MPa.

## 14.19.5 Propeller Shaft Brackets of Materials other than Carbon Steel.

Where a material other than carbon steel is used, the Authority may allow the thickness of the legs to be determined from:

$$t_z = t \sqrt{\frac{410}{T}}$$

$t_z$  = thickness of the leg of material other than carbon steel in mm

$t$  = thickness of the leg determined in accordance with sub-paragraphs 14.19.3.2 or 14.19.4.2 whichever is appropriate

$T$  = Ultimate tensile strength of material in MPa

## 14.19.6 Leg Length

The length of the longer leg of a V bracket or the leg of an I bracket measured from the outside perimeter of the boss to the outside of the shell plating is not to exceed 10.6 times the diameter of the propeller shaft. Where this length is exceeded the width and thickness of the legs or leg are to be increased and the bracket design will be given special consideration.

14.19.7 Where the bracket is a hollow section, the modulus of section is to be at least equal to the modulus of section of the solid bar as required by the preceding paragraphs.

## 15. Fuel Systems

## 15.1 Fuel Tanks Forming Part of the Hull Structure

Fuel tanks forming part of the vessel's hull structure shall comply with the relevant provisions of the Construction Section.

## 15.2 Free-Standing Non-Portable Metal Fuel Tanks

15.2.1 Free-standing non-portable metal fuel tanks shall be substantially constructed of carbon steel, stainless steel, copper or marine grade aluminium alloy. No part of the fuel tank shall depend on soft solder for tightness.

15.2.2 Where a dimension parallel to the longitudinal axis of a tank exceeds 1 m, baffles spaced not more than 1 m apart may be required.

15.2.3 The minimum thickness of carbon steel used in the construction of a fuel tank shall be determined using the dimensions of the largest unsupported panel but shall not be less than 3 mm. In assessing the largest unsupported panel account shall be taken of the support afforded by:

(a) tank boundaries;

(b) baffles, where the thickness of the baffles is not less than the thickness of the tank plating in way; and

(c) stiffeners, where

(i) the thickness of the stiffener is not less than the thickness of the tank plating in way, or 5 mm, whichever is the greater; and

(ii) the depth of the stiffener is not less than  $\frac{10}{12}$  = breadth of the panel mm

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15.2.4 Where the depth from the top of the filling pipe to the bottom of the tank does not exceed 2.5 m the plate thickness shall be obtained from figure 15.2.4 which is developed from the formula:

$$t = 0.024 ac$$

where  $t$  = thickness of plate in mm

$a$  = width of panel (minor axis) in mm

$c$  = numerical value as given below, where

$b$  = length of panel (major axis) in mm

$\frac{b}{a}$	1	1.25	1.5	1.75	2 and over
$c$	0.226	0.258	0.275	0.284	0.288

15.2.5 Where the depth from the top of the filling pipe to the bottom of the tank exceeds 2.5 m the plate thickness shall be calculated from the formula:

$$t = 0.024 ac \sqrt{\frac{h}{2.5}}$$

where  $t$ ,  $a$ ,  $b$  and  $c$  are as defined in paragraph 15.2.4 and  $h$  = distance from top of filling pipe to bottom of tank in m.

15.2.6 Where a material other than carbon steel is used, the Authority may allow the plate thickness to be determined from:

$$t_i = t \sqrt{\frac{410}{T}}$$

where  $t_i$  = plate thickness of material other than carbon steel in mm.

$t$  = thickness of plate in mm determined in accordance with paragraph

15.2.4 or 15.2.5 as appropriate

$f$  = ultimate tensile strength of material in MPa.

15.2.7 The pressure test of a tank shall be carried out prior to its installation in the vessel.

## 15.3 Installations with Non-Portable Fuel Tanks

## 15.3.1 Fuel Tank Pressure Test

A fuel oil tank shall be subjected to a test equivalent to 2.5 m of fresh water above the top of the tank or to the maximum head to which the tank may be subject in service, whichever is the greater.

## 15.3.2 Fuel Tank Location

15.3.2.1 Taking account of the possibility of overflow, leakage or rupture, fuel storage tanks and piping should be arranged to minimize the possibility of fuel coming into contact with a hot surface or electrical components which may result in outbreak of fire.

15.3.2.2 Fuel tanks should not be fitted over stairways and ladders, hot surfaces and electrical equipment. However, where this is unavoidable, each tank shall be provided with a self draining save-all. The Board, may waive this requirement where the fuel tank is supplied as an integral part of the engine.

### 15.3.3 Fuel Tank Venting

The vent pipe for a fuel tank shall be of size sufficient to prevent generation of pressure. Where the tank filling is effected by pumping through the filling line, the area of air escape shall not be less than 1.25 times the area of the filling pipe.

The pipe shall terminate in a gooseneck, the top of the bend not being less than the height of the bulwark or the top of the guard rail. Where the pipe outlet exceeds 18 mm in diameter a corrosion resistant wire gauze screen shall be fitted. The open area of the screen shall be not less than the cross-sectional area of the vent pipe. Where the Board considers the provision of a suitable vent pipe is not practicable it may permit a small vent hole in the filling cap.

### 15.3.4 Fuel Tank Inspection Opening

A suitable manhole or hand hole to facilitate cleaning and inspection shall be provided except that this requirement may be dispensed with in the case of free-standing non-portable tanks which have a capacity of less than 800 L.

### 15.3.5 Fuel Shut-off

15.3.5.1 A shut-off valve or cock shall be fitted in each tank outlet line. Non-metallic piping and fittings shall not be fitted in the line between the tank and this shut-off valve or cock.

15.3.5.2 Means shall be provided outside a propulsion machinery space, in an accessible position not likely to be isolated by a fire in the space, to shut off the fuel to the main and auxiliary engines by means of a fire-safe valve or cock. Non-metallic piping and fittings shall not be fitted in the line between any fuel tank and this fuel shut-off.

### 15.4 Safety Devices for Power Operated Fuel Pumps and Motors.

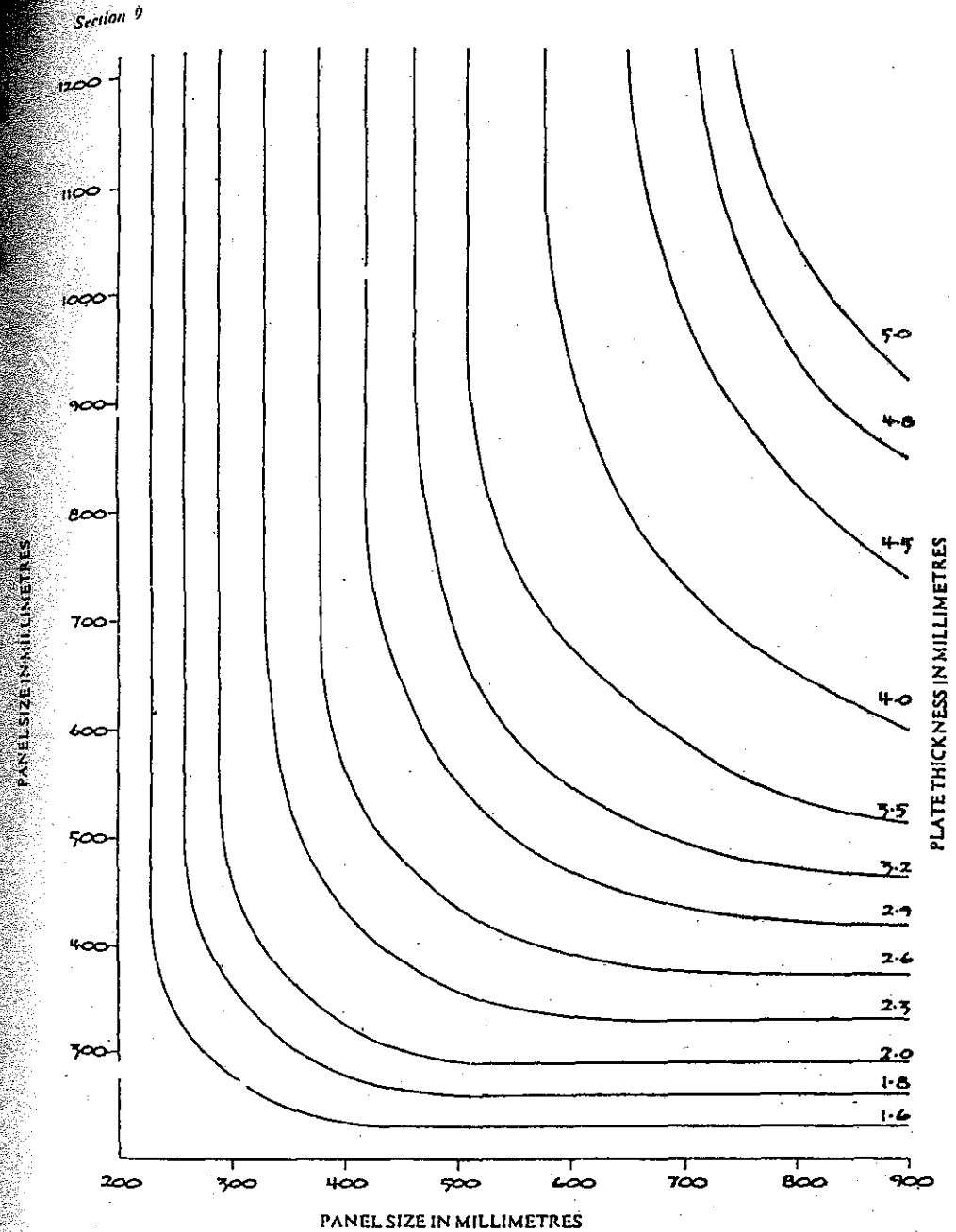


Figure 15.2.4

15.4.1 If the closed discharge pressure of a cargo oil pump, fuel transfer pump or fuel pressure pump exceeds the maximum design working pressure of the discharge system, a relief valve discharging back to the suction side of the pump shall be fitted.

15.4.2 Stop valves shall be provided on the suctions and deliveries of cargo oil, fuel transfer and fuel pressure pumps.

15.4.3 A fuel transfer or a cargo oil pump which is located below deck in a machinery space shall be provided with means to stop the pump from both inside and outside the space.

#### 15.5 Fuel Filters

Filters manufactured of steel or an equivalent material may be fitted at any position in the fuel system. See-through glass or plastic filters shall be resistant to both mechanical impact and thermal shock and may only be fitted in a protected position.

15.6 Fuel Systems for Vessels Having Engines which Operate on Fuel with Flashpoint of 60°C or More.

#### 15.6.1 Fuel Tank Filling

Each fuel oil tank shall be provided with a permanent filling pipe of suitable material led from the deck to the top of the tank. Where the Board considers that a flexible section is necessary between the decks and tank fitting, the flexible section shall be of reinforced synthetic rubber piping which is resistant to fuel, salt water and vibrations. It shall be fastened to the deck fitting and tank fitting with corrosion resistant clips.

#### 15.6.2 Fuel Tank Contents Measurement

Suitable means shall be provided for determining fuel tank contents and they shall be such that in the event of a tank being overfilled, spillage, through them shall not occur.

Where a level indicating gauge glass is fitted on a fuel tank it shall be fitted with self-closing valves or cocks, provided that where the upper end of the gauge glass is connected to the tank through the top plating, only one such self-closing valve or cock at the lower end need be fitted. Oil fuel tank soundings should not be located in crew accommodation but where in exceptional circumstances they are located in alleyways, flush deck screwed caps should be fitted.

#### 15.6.3 Fuel Tank Drain

Each fuel service tank having a capacity of 400 litres or more shall be fitted with a drain valve or drain cock, the open end of which is blanked with a screwed plug. Tanks having a capacity less than 400 litres shall be fitted with a screwed drain plug.

#### 15.6.4 Fuel Filling Stations

Oil fuel filling stations shall be situated outside machinery spaces and be so arranged that any overflow cannot come into contact with a hot surface.

#### 15.6.5 Fuel Piping

Fuel piping shall be of seamless steel or heavy gauge copper. The piping shall be connected by flanged joints, metal to metal joints of the conical type or by other acceptable means.

Where cone nipples are used they are to be welded. Olive type compression fittings shall not be used. Connections in pipes shall be kept to a minimum and shall be so located as to be readily visible and accessible. Flexible piping may be fitted:

- between the fuel shut-off valve required under sub-paragraph 15.3.5.2 and the engine;
- to conduct any fuel by-pass back to the top of the fuel tank

Flexible piping shall be of metal braided reinforced type having a synthetic rubber inner tube and must have a high resistance to salt water, petroleum products and vibration. It shall be capable of containing fuel after being exposed to free-burning kerosene for a period of 21 minutes. It must be so installed as to be readily visible, clear of the bilge and effectively secured to prevent chafing.

15.7 Fuel Systems for Vessels having engines which Operate on Fuel with a Flashpoint less than 60°C, but not including Installations which Employ Portable Fuel Tanks.

#### 15.7.1 Gravity Feed Fuel System

Engines employing a gravity feed fuel system will not be permitted except that this requirement may be waived in the case of small engines with a tank not exceeding 101 capacity.

#### 15.7.2 Fuel Tank Capacity

Fuel tanks shall be no larger than necessary for the intended service of the vessel but shall be of sufficient capacity to prevent them having to be filled at sea. No loose cans of fuel shall be carried on board a vessel for this purpose.

#### 15.7.3 Fuel Tank Location

Fuel tanks shall be securely installed in positions as remote from the engine and exhaust pipes as practicable. When they are installed in a compartment the compartment shall be well ventilated. Provision is to be made to allow, as far as practicable, the external inspection of the tanks and fittings.

#### 15.7.4 Fuel Tank Filling Pipe

Fuel tanks shall be provided with a filling pipe so arranged as to prevent fuel spillage entering the vessel. The filling pipe is to extend internally to near the bottom of the tank and shall be fitted with a watertight cover.

Where the Board considers that a flexible section is necessary between the deck and tank fitting, the flexible section shall be of a reinforced type, having a synthetic rubber inner tube and be resistant to fuel, salt water, and vibration. It shall be secured to deck and tank fitting with corrosion resistant metal clips.

#### 15.7.5 Fuel Pump Suction

When a fuel pump is employed the fuel shall be drawn from the tank by means of a pipe extending internally from the top of the tank to near the bottom of the tank. An anti syphon device shall be provided in the line.

#### 15.7.6 Fuel Tank Venting

A vent pipe shall be led from each tank to an open position where no danger will arise from escaping vapour.

#### 15.7.7 Fuel Piping

Fuel piping shall be of seamless steel or heavy gauges copper. The piping shall be connected by metal to metal joints of the conical type or by other acceptable means. Where cone nipples are used they are to be welded. Olive type compression fittings shall not be used. Connections in pipes shall be kept to a minimum and shall be so located as to be readily visible and accessible. A short length of flexible piping may be fitted in the section of line between the engine bed and the fuel lift pump. Such flexible piping shall be of metal braided reinforced type having a synthetic rubber inner tube and must have a high resistance to salt water, petroleum products and vibration. It shall be capable of containing fuel after being subject to a 2½ minute exposure to free burning kerosene. It must be so installed as to be readily visible. Fuel filters may be fitted with screwed drain plugs but drain cocks on valves should not be fitted.

### 15.7.8 Electric Bonding

All elements of the fuel installation shall be electrically bonded.

### 15.7.9 Carburettor Trays

Carburettors (other than the down draught type) which can be flooded or overflowed must be fitted with a copper or brass fuel tight drip tray. Such trays must have sweated into it not less than 13 mm below it. A corrosion resistant wire gauze screen. The tray shall be of a size sufficient to impound any leak from the carburettor and shall be readily removable for emptying.

The carburettor must be fitted with an efficient flame trap.

### 15.7.10 Engine Enclosure

Where a petrol engine is installed in an enclosure, the enclosure shall be well ventilated.

15.8 Fuel Systems for Vessels Having Engines which Operate on Fuel with a Flashpoint less than 60°C and which Employ Portable Fuel Tanks.

#### 15.8.1 Portable fuel tanks shall:

- (a) be not more than 30l capacity,
- (b) be designed and constructed to allow ease of handling and be provided with means for locating and securing against movement,
- (c) be manufactured from metal which is corrosion resistant or coated to provide protection from corrosion and where necessary shall have mated parts that are galvanically compatible,
- (d) have all service and vent openings above the full contents level,
- (e) be fitted with a fuel contents gauge,
- (e) have base areas in proportion to their height to minimise upsetting.

15.8.2 Where the vessel is fitted with a flush or sealed deck, portable fuel tanks shall be situated above that deck in such a position as to prevent any spillage of fuel from draining below the deck.

15.8.3 Where portable fuel tanks are fitted, the fuel lines shall be of heavy duty synthetic rubber fitted with bayonet type fittings which when disconnected with automatically shut off from the tank.

## 16. Shiplside Valves and Sea Water Piping

### 16.1 Inlet and Discharge Valves—General

All sea inlet and overboard discharge pipes shall be fitted with screwdown valves or cocks unless required otherwise by the Load Lines Section and except that:

- (a) discharge valves or cocks shall not be required in the case of discharges (including sanitary discharges) having bore diameters not exceeding 50 mm, and the lowest points of which are not less than 230 mm above the load water line; and
- (b) discharges which are led through the vessels side from spaces above the bulkhead deck may be fitted with non-return valves in lieu of screw down valves or cocks.

### 16.2 Requirements for Valves and Cocks

16.2.1 Valves and cocks shall be of bronze, cast steel or equivalent material. Where a valve with a screwed cap is a sea injection valve or a valve controlled by an extended spindle, the cover shall be secured so that it cannot slacken when the valve is operated.

16.2.2 Shiplside valves and cocks with a bore greater than 50 mm shall be of the flanged type. Valves and cocks not greater than 50 mm bore may be of the screwed type.

### 16.3 Fitting of Valves and Cocks

16.3.1 Flanged valves and cocks shall be mounted on suitable pads or flanges which are secured to:

- (a) the hull of the vessel;
- (b) suitable water boxes; or
- (c) standpipes which shall be as short as practicable.

16.3.2 Valves and cocks of the screwed type shall be secured to the hull of the vessel by means of a suitable skin fitting or standpipe. The finished wall thickness of any such fitting or stand pipe shall not be less than the thickness of the hull plating to which it is attached.

16.3.3 The valves or cocks must be so fitted that they are readily accessible at all times.

### 16.4 Gratings

Gratings shall be fitted on the outside of the hull, to all sea water inlets. The clear area through the gratings shall be not less than twice the area of the valve connected.

### 16.5 Pipe Materials

All pipes that can be placed in communication with the sea are to be a heavy gauge copper or steel. Suitable reinforced synthetic rubber piping having a high resistance to salt water, fuel oil, heat and vibration, and capable of operation under suction without collapse and resultant reduction in effective area, may be used:

- (a) in short lengths for vibration damping;
- (b) in vessels of less than 15 m in length, provided that the length of piping does not exceed half the beam of the vessel, the run of piping is direct as practicable and it is adequately supported.

When installed the rubber piping shall be readily visible and protected against mechanical damaged and contact with hot surfaces.

### 16.6 Securing of Flexible Pipe

The method of securing a flexible pipe to a rigid pipe or fitting shall be by corrosion resistant clips or pressed ferrules.

For flexible piping of 25 mm internal diameter and above not less than two clips shall be fitted at each end.

### 16.7 Material of Pipe Fittings

The material of pipe fittings shall not be of malleable iron.

## 17. Bilge Pumping Arrangements

### 17.1 General

17.1.1 Subject to paragraph 17.1.2 every vessel shall be provided with a pumping system capable of pumping from and draining any water tight compartment in the vessel.

17.1.2 A watertight compartment less than 7% of the total under deck 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.

17.1.3 In the case of a vessel of Classes 1, 2, 3A or 3B 15 m in length and over the system shall permit pumping and draining from every space in the vessel whilst any one watertight compartment is flooded.

#### 17.2 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 kl/hr	No.	Capacity in kl/hr
Less than 7.5.	1	4.0		
7.5 and over but less than 10.	2	4.0		
10 and over out less than 12.5.	1	5.5	1	5.5
12.5 and over but less than 17.5.	1	5.5	1	11.0
17.5 and over but less than 20.	1	8.0	1	11.0
20 and over but less than 25.			2	11.0
25 and over but less than 35.			2	15.0

#### 17.3 Pump Details

In any vessel:

- a power pump may be substituted for a manually operated pump;
- 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 pumps shall not be dependent on the same source of power;
- where a vessel is required by sub-clause 17.2 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
- a bilge pump shall be of the self priming type or be provided with a suitable priming device.

#### 17.4 Pipe Materials

17.4.1 All bilge piping shall be of steel or heavy gauge copper, except that non-metallic bilge piping may be used on vessels of Class 30, which are less than 15 m in length.

17.4.2 Notwithstanding the provisions of 17.4.1 and subject to 17.5 reinforced synthetic rubber piping may be used as tail pipes.

17.4.3 Where non-metallic bilge piping is used 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.

#### 17.5 Strainers

17.5.1 On vessel of 20 m in length and over 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. The Board may give special consideration to the aforementioned arrangements having regard to the accessibility of a bilge suction.

17.5.2 Strainer holes shall not be greater than 10 millimetres diameter and the aggregate area of the holes shall not less than twice the area of the suction pipe.

#### 17.6 Back Flooding

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 25 m 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 of a non-return type.

#### 17.7 Pipe Sizes

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

$$(a) d_m = 25 = 1.68 \sqrt{L(B+D)}$$

$$(b) d_b = 25 = 2.16 \sqrt{C(B+D)}$$

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

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

L = the measurement length of the vessel in m

B = breadth of vessel in m

D = depth of vessel in m

C = length of compartment in m.

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

17.7.2 In vessels of less than 10 m in length, the diameter of the bilge piping shall not be less than 25 mm.

#### 17.8 Bilge Level Alarm

In all decked vessels other than Class 3E 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.

#### 18. Fish Tank Pumping Systems

##### 18.1 Non-Metallic Piping

18.1.1 Non-metallic piping may be used for filling cargo tanks provided that:

- bilge alarms are fitted in each compartment in which the piping is installed;
- the sea suction valves can be readily closed from a position above the bulkhead deck;
- any penetration by the piping of a machinery space bulkhead is via suitable valve; and

- (d) All connections to the tanks are readily accessible and have valves attached directly to the tanks or to heavy gauge metal piping attached directly to the tanks and provided that where the connections are not near the top of the tanks, the valves shall be capable of being readily closed from a position above the bulkhead deck or shall be non return valves.

18.1.2 Non-metallic piping may be used for discharging fish cargo tanks subject to compliance with sub-paragraphs (a), (c) and (d) of paragraph 18.1.1

#### Collision Bulkhead Valve

A pipe piercing a collision bulkhead shall be fitted with a screw down valve or cock at the bulkhead. The valve or cock shall be controllable from the bulkhead deck and an appropriate open/close indicator shall be provided. If the valve or cock is fitted on the after side of the bulkhead and is readily accessible under all service conditions, the remote control may be dispensed with.

#### 20. Sounding Devices and Sounding Pipes

20.1 A suitable means shall be provided for determining the liquid content of:

- (a) any weight compartment, which is not part of the machinery space, including a cofferdam and a double bottom tank; and  
(b) any cofferdam and double bottom tank which is located in the machinery space.

20.2 Where a sounding pipe is fitted it shall:

- (a) for a pipe located outside of the machinery space, extend to a readily accessible position on deck;  
(b) for a pipe located in a machinery space, extend to a readily accessible position. It shall extend to deck level or to a lesser height if the pipe is furnished with a cock having a parallel plug with a permanently secured handle so loaded that on being released it automatically closes the cock; and  
(c) terminate in such a position that there is no danger of overflow spillage on to hot surfaces or electrica equipment.

20.3 The upper end of a sounding pipe shall be provided with means of closing to prevent the free entry of water.

20.4 A sounding pipe shall be as straight as practicable and if curved to suit the shape of the vessel, the curvature shall be sufficient to permit the passage of a sounding rod or a sounding chain.

20.5 A sounding pipe shall be of metal not less than 4.5 mm in thickness and be not less than 32 mm internal diameter.

20.6 A sounding pipe shall be protected against mechanical damage and where it passes through any refrigerated space shall be thermally insulated.

20.7 A striking plate shall be fitted under the lower end of a sounding pipe.

#### 21. Steering Gear

21.1 All vessel except twin screw vessels shall be fitted with two effective independent means of steering, one of which may be a hand tiller, except that where the normal means of steering is a hand tiller an alternative means need not be provided. The secondary or emergency gear shall be capable of being brought speedily into action.

#### 21.2 Design

21.2.1 The steering gear arrangement shall be of adequate strength and sufficient to steer the vessel at maximum speed. The steering gear shall be so designed that it is not damaged at maximum astern speed.

21.2.2 Components that transmit torque, tensile stresses or shock loads shall not be of ordinary cast iron or other similar non-ductile material.

21.2.3 Rudder movement should be 35° port and starboard and formulae indicated in clause 22 are based on these helm angles. Rudder movement less than or in excess of 35° shall only be permitted with the approval of the Authority and in such cases the Authority may allow a reduction or require an increase in the diameter of the rudder stock.

21.2.4 In a vessel of 10 m in length and over the steering gear shall be capable of putting the rudder over from 35° on one side to 30° on the other in 30 seconds when the vessel is at maximum ahead service speed with the rudder totally submerged, and, if normally operated shall be designed to prevent violent recoil of the steering wheel.

#### 21.3 Hydraulic Systems

Hydraulic Steering Systems shall meet the requirements of clause 25 and otherwise comply with the following:

21.3.1 Means to facilitate a quick change over from the primary to the secondary steering shall be fitted.

21.3.2 In power systems a relief valve shall be installed and set to prevent mechanical damage to the steering gear.

21.3.3 Hydraulic piping shall be so arranged to avoid the possibility of damage.

#### 21.4 Helmsman's View

The steering arrangement shall be such that the operator has a clear view ahead in the normal steering position.

#### 21.5 Rudder Movement Direction

21.5.1 The trailing edge of the rudder blade of a vessel shall move in the same direction as the top spokes of the steering wheel.

21.5.2 In a vessel of 15 m and over filled with power operated steering gear, a rudder position or shall be fitted. It shall be so placed as to be in full view of the helmsman whilst he is at the normal steering position.

#### 21.6 Transmission Shaft Bearings

Steering gear transmission shafts shall be adequately supported in bearings spaced not more than 70 times the diameter of the transmission shaft, provided that bearing spacing adjacent to sprockets or gears is such that no undue bending load can be applied to the shaft.

#### 21.7 Tiller Arm

21.7.1 The section modulus of a tiller arm just clear of the boss, or quadrant just clear of the boss, shall not be less than:

$$Z = \frac{0.15d^3(a-b)}{1000a}$$

where Z = section modulus of quadrant or tiller in cm<sup>3</sup> about the vertical axis

- d = required diameter of the upper rudder stock in mm  
a = distance from the point of application of the load on the tiller or quadrant to the centre of the rudder stock in mm  
b = distance between the section of tiller or quadrant just clear of the boss and centre of the rudder stock in mm.

For tillers of rectangular section, the ratio between the breadth and thickness is not to be greater than 3.

**Note:**

This formula is based on the material of the tiller arm and upper rudder stock being carbon steel having a U.T.S. of 410 MPa.)

21.7.2 The section modulus at the point of application of the load is to be not less than one third of that required by paragraph 21.7.1.

21.7.3 The outside diameter of the tiller arm boss or quadrant boss is to be not less than 1.8 times the rudder stock diameter, and the depth is to be not less than the rudder stock diameter.

21.7.4 The distance from the tiller arm boss to the nearest bearing, gland or other support should not exceed 2.5 times the required diameter of the rudder stock.

## 22. Rudder and Rudder Stocks

### 22.1 Materials

22.1.1 Unless otherwise stated, rudder couplings, coupling bolts, gudgeons and similar parts subject to dynamic stress shall be manufactured from materials complying with the requirements of paragraph 14.6.2.

22.1.2 Unless otherwise stated rudder plating and stiffeners shall be of material complying with those requirements specified for hull material in the Construction Section (Steel Vessels).

### 22.2 Upper Stock Size

A rudder stock above the top pintle for an unbalanced rudder or above the neck bearing for a balanced rudder is to be not less than obtained from the formula:

$$d = C \sqrt{RAV^2}$$

where  $d$  = diameter of upper stock in mm

$R$  = distance in mm from the centre line of stock to the centre of area of  $A$

$A$  = area of rudder in m

$V$  = sea speed of vessel in knots with:

a minimum of 8 in vessels up to 30 m in length;

a minimum of 9 in vessels of 30 m in length and over.

$C$  for vessels up to 30 m in length:

= 21.66 where  $V=8$

= 19.2 where  $V=14$  or over.

For values of  $V$  between 9 and 15,  $C$  may be obtained by interpolation.

### 22.3 Unbalanced Rudder Main Piece Size

For an unbalanced rudder, the main piece shall be of the required diameter for the upper stock at the top arm of a single-plate rudder or the top of a built up rudder but the diameter may be gradually reduced until it is  $0.75d$  at the bottom.

### 22.4 Balanced Rudder Lower Stock Size

22.4.1 For a balanced rudder, the stock in way of and below neck bearings shall have diameters not less than obtained from the following equation:

$$d_l = C \sqrt{RAV^2}$$

where  $d_l$  = diameter of lower stock in mm

$R$  =  $0.25(a^2 + a^2 + 16b^2)$  for a balanced rudder which has efficient neck and bottom bearings.

$R$  =  $a^2 + a^2 + b^2$  for a balanced rudder which has no bottom bearings

- $A$  = area of rudder in  $m^2$   
 $a$  = vertical distance from the bottom of the neck bearing to the centre of area of  $A$  in m  
 $b$  = horizontal distance from the centre of the lower stock to the centre of area of  $A$  in metres  
 $V$  = speed of vessel in knots with a minimum of 8 in vessels up to 30 m in length and a minimum of 9 in vessels of 30 m in length and over.

$C$  shall be determined according to the following:

- (a) where the speed of the vessel is not greater than 4 LWL, LWL being the length of the vessel in m at the designed waterline, and the length of the vessel is less than 30m.

$$C = 21.66 \text{ where } V = 8$$

$$C = 19.20 \text{ where } V = 14 \text{ and over}$$

For values of  $V$  between 8 and 14,  $C$  may be obtained by interpolation;

- (b) where the speed of the vessel is not greater than 4 LWL, with LWL being the length of the vessel in m at the designed waterline, and the length of the vessel is 30m in length and over.

$$C = 21.66 \text{ where } V = 9$$

$$C = 19.20 \text{ where } V = 15 \text{ and over}$$

For values of  $V$  between 9 and 15,  $C$  may be obtained by interpolation; or

- (c) where the speed of the vessel is greater than 4 LWL, LWL being the length of the vessel in m at the designed waterline.

$$C = 16$$

22.4.2 The mainpiece of a balanced rudder having efficient neck and bottom bearings is to be full diameter for at least  $2/3$  of the distance from the neck to the bottom bearing. The diameter may be gradually reduced below this point until it is  $0.75d$ , in the bottom bearing. The mainpiece is to extend into the bottom bearing for a distance not less than  $0.7d$ . Both bearings are to be bushed.

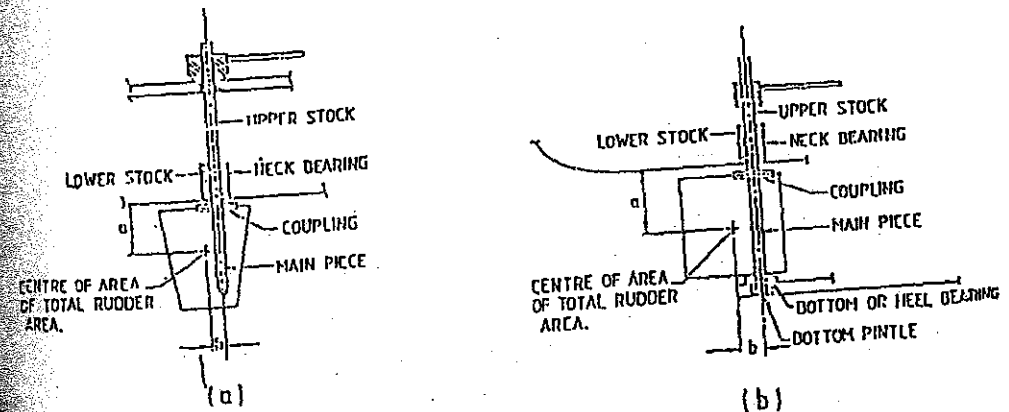


FIGURE 22-4



22.4.3 The stock of balanced rudder having no bottom bearing is to be full diameter to the underside of the top rudder arm if a single plate rudder, or to the top of the rudder if a built-up rudder. The diameter may be gradually reduced below this point until it is  $0.5d$ , and the length of stock in way of the rudder shall not be less than  $2/3$  of the depth of the rudder at the centre line of the stock.

22.5 Rudder Stock Sizes of Material other than Carbon Steel.

The diameter of a rudder stock or main piece of material other than carbon steel shall be:

$$d = \sqrt[3]{\frac{410}{T}}$$

where  $d$  equals the diameter of the rudder stock in millimetres as required by sub-clause 22.2 and 22.4 and  $T$  equals the minimum ultimate tensile strength of the material in MPa.

22.6 Rudder Bearings and Pintles

22.6.1 The neck bearing for rudders shall be bushed, be of the type shown in Fig. 22.4(b) and not be less in depth than 1.5 times the required stock diameter. For spade rudders of the type shown in Fig. 22.4(a) the neck bearings shall not be less in depth than 4 times the required stock diameter unless an upper bearing is fitted. Bearings are to be adequately supported and housings effectively attached to the vessel's structure.

22.6.2 The diameter of rudder pintles shall not be less than 0.75 times the required diameter of the rudder stock, and the depth of pintle bearings shall not be less than the required diameter of the pintle.

22.6.3 Where more than one pintle is fitted the required diameter may be reduced by 10 per cent for each additional pintle fitted.

22.7 Coupling Types

Some acceptable forms of flanged rudder couplings are as follows:

- Couplings of fabricated construction, provided that they are suitably designed, prepared and heat treated subsequent to welding.
- Couplings formed by upsetting the end of the stock provided that there is no necking or narrowing of the stock.
- Couplings fitted on a taper, keyed and held in place by a nut.

22.8 Coupling Dimensions

The scantlings of rudder couplings are to be in accordance with the following:

22.8.1 The thickness of the flange shall be:

- for a rudder with a pintle or bottom bearing not less than 0.25 times the diameter of the rudder stock or equal to the required diameter of the coupling bolts whichever is the greatest; and
- for a spade rudder not less than 0.3 times the diameter of the rudder stock or equal to the required diameter of the coupling bolts whichever is the greater.

22.8.2 The fillet radius at the base of the flange shall not be less than 0.125 times the diameter of the stock.

22.8.3 The ligament thickness outside the coupling bolt holes shall not be less than 0.6 times the diameter of the coupling bolt.

22.8.4 The pitch circle radius of bolts for couplings of the forged or welded flange type shall not be less than the diameter of the rudder stock, and for couplings keyed to the stock shall be not less than 1.25 times the diameter of the rudder stock.

22.8.5 Couplings keyed to the stock shall be provided with keys of the type specified in paragraph 14.9.3 and having width and thickness in accordance with paragraph 14.9.4 or 14.9 as appropriate.

22.8.6 The boss thickness of keyed couplings shall not be less than 1.5 times the required thickness of the key and the boss length shall not be less than 1.5 times the required diameter of the rudder stock.

22.8.7 Where a rudder stock is 150 mm or more in diameter at least 6 bolts are to be used in each coupling flange. Where the diameter is less than 150 mm, at least 4 bolts are to be used in each coupling flange. The total area of bolts is not to be less than that determined from the following formula:

$$A = \frac{0.3 \times d^3}{R}$$

where  $A$  = total bolt area in  $\text{mm}^2$  at root of threads

$R$  = pitch circle radius of bolts in mm

$d$  = required diameter upper stock in m.

22.8.8 Rudder coupling bolts shall be machine finished, neat fitting and the nuts shall be effectively locked.

22.9 Spade Rudders

Acceptable forms of spade rudder are as follows:

22.9.1 Fabricated or cast rudder blade with intergal flange secured to a rudder stock with flange by fitted bolts. (With this type of rudder the sizes of the couplings and bolts are to be based on the required diameter of the lower rudder stock, but due regard shall also be given to the bending and tensile stresses to which they may be subject arising from the forces on the rudder.)

22.9.2 Fabricated or cast rudder blade attached to rudder stock by means of a taper with key and securing nut. (The length of the taper is not to be less than 1.5 times the required diameter on the lower rudder stock. The taper is to be between the limits of  $m 12$  and  $1$  in  $16$  on diameter, but should preferably be in  $1$  in  $12$ ).

22.9.3 Fabricated rudder blade intergal with rudder stock.

22.9.4 Fabricated or cast rudder blade shrunk on to a parallel rudder stock and additionally secured with dowells.

22.9.5 Rudders with the blade cast on to the rudder stock are subject to the approval of the Board. The approval will be dependent upon the design and construction method and may also be dependent on the result of proof load testing.

22.9.6 Cast rudder blades shall be of ductile material.

22.9.7 The pressure on the rudder bearings should, in general, not exceed 3.9 MPa. For bearings with efficient lubrication a pressure of 5.9 MPa may be accepted.

For the determination of the pressure on the bearings the rudder force may be calculated from the following formula:

$$F_p = 196AV$$

where  $A$  = area of rudder in  $\text{m}^2$

$V$  = speed of vessel in kn

## 22.10 Single Plate Rudders

22.10.1 A single plate rudder with upper stock diameter measuring 75 mm or less shall have a plating thickness not less than obtained from the formula  $t=0.15d+6$ .

A single plate rudder with upper stock diameters  $d$  measuring more than 75 mm shall have a plating thickness not less than obtained from the formula  $t=0.04d+14$ .

where  $t$  = thickness of rudder plate in mm

$d$  = required diameter of upper rudder stock in m.

Where speed of the vessel exceeds 15 kn, the required thickness of the rudder plate shall be increased at the rate of 1mm/kn of excess speed.

Where distances between centres of rudder stiffeners are less than obtained from the formula in 20.10.2 the thickness of the rudder plating  $t$ , may be given special consideration.

22.10.2 The distance between centres of single plate rudder stiffeners is not to be greater than that obtained from the following formula:

$$h=2.5d+952.5$$

where  $h$  = vertical distance between the centres of stiffeners in mm; and

$d$  = required diameter of upper rudder stock in m.

The section modulus ( $Z$ ) in way of the stiffeners immediately forward and aft of the stock is not to be less than that obtained from the following formula:

$$Z=0.8(d-51) \text{ cm}^3$$

The breadths 'b' of the stiffeners may be tapered forward and aft of the maximum breadths required to satisfy the above section modulus. However, the breadths at the leading and trailing edges of the rudder are not to be less than obtained from the following formula:

$$b=0.1d+8$$

where  $b$  = breadth of the stiffeners in mm.

22.10.3 The blade of a single plate rudder shall be attached to the main piece by a full penetration continuous weld. Stiffeners shall be attached to the main piece and blade by a double continuous fillet weld.

### Double Plate Rudders

22.11.1 Double plate rudders are to have horizontal internal webs.

22.11.2 In the case of a vessel less than 20 metres in length the thickness of plating for a double plate rudder shall be in accordance with table 22.11.2.

TABLE 22.11.2

Diameter of rudder stock derived from formula in mm	Plate thickness mm		
	Spacing of webs in mm		
	300	450	600
(1)	(2)	(3)	(4)
less than 40 .....	4.5	4.5	6.5
40 and over but less than 45 ...	4.5	6.5	6.5
45 and over but less than 60 ...	4.5	6.5	8.0
60 and over but less than 65 ...	6.5	6.5	8.0
65 and over but less than 75 ...	6.5	8.0	9.5

Horizontal and vertical webs in double plate rudders not replacing the main piece are to have the same thickness as the side plates. Plates forming the top and bottom of the rudders are not to be less than the thickness given in column (4).

22.11.3 Where the required rudder stock diameter exceeds 75 mm the thickness of the rudder side plating and webs is not to be less than obtained from the following formula:

$$t = 6.5+0.117V \ A$$

where:

$t$  = plate thickness in mm

$V$  = sea speed of vessel in kn with an 8 kn minimum with vessels less than 30 m in length and a 9 kn minimum with vessels of 30 m and over.

$A$  = total area of rudder in  $\text{m}^2$ .

The distance between centres of the webs is not to be greater than obtained from the formula:

$$Sp = 585+2.41V \ A$$

where:

$Sp$  = distance between centres in mm; and  $V$  &  $A$  are as defined above.

The thickness of the plating is to be increased at the rate of 0.015 mm for each mm of spacing greater than that given by the formula and may be reduced at the same rate for lesser spacing.

22.11.4 Special attention is to be given to the attachment of the rudder arms, pintle gudgeons and rudder coupling to the body of the rudder.

Horizontal and vertical stiffeners in double plate rudders are to be attached to the mainpiece by continuous double fillet welds and to the plating by fillet welds consisting of 75 mm increments spaced 150 mm between their centres. Where the interior of the rudder is inaccessible for welding the stiffeners shall be fitted with flat bars and the plating connected to these flat bars by continuous or slot welds.

22.11.5 Double plate rudders are to be watertight. Means for draining the rudder shall be provided. Double plate rudders are to be tested by a head of water of 2.5m or equivalent.

### 22.12 Wooden Rudders and Steering Nozzles

The construction and scantlings of wooden rudders and steering nozzles shall be specially considered.

### 22.13 G.R.P. Rudders

G.R.P rudders are to incorporate a substantial steel spider formed by perforated plate arms, approximately half the rudder width in length and welded to the rudder main piece. The main piece is to be continuous through the rudder but where this is not possible owing to the design at the rudder, suitable arrangements are to be made to ensure continuity of strength and alignment. The blade is to be moulded from mats with or without woven rovings, and is to be bonded with epoxy or polyester resins. The rudder is to be filled with a suitable material such as a resin/glass dough or a micro-balloon mixture.

### 22.14 Rudder Support

The weight of a rudder is to be suitably supported at the heel pintle or by a suitable carrier bearing. The structure in way of a carrier bearing is to be adequately strengthened for that purpose.

### 22.15 Rudder Stops

22.15.1 Effective means shall be provided to limit vertical movement of the rudder.

22.15.2 Effective stops to prevent the rudder coming into contact with the propeller or hull shall be provided.

### 23. Windlass

23.1 A mechanical lifting device provided in a vessel to meet the requirements of the Miscellaneous Equipment Section shall constitute a windlass of capstan. Cable stoppers, claws or similar fastenings shall be provided as necessary between the windlass or capstan and the hawse pipe. The windlass or capstan is to be designed for immediate dropping of the anchor and with an efficient brake.

For an anchor mass of less than 50 kg, the windlass or capstan may be hand operated provided that the applied efforts shall not exceed 155 N when lifting the anchor and total length of cable fitted.

23.3 For an anchor mass of 50 kg and above a power operated windlass or capstan shall be provided. It shall be capable of lifting one anchor and 35 m of its chain cable plus a 20 per cent overload at a speed of not less than 7.5m per minute.

### 24. Air Compressors

A compressor for the supply of compressed air for purposes other than breathing apparatus shall be in accordance with the following.

24.1 An air compressor shall be provided with a relief valve of such size and set that when the compressor discharge valve is closed and the compressor is running normally, the maximum accumulation pressure will not exceed the working pressure by 10 per cent.

24.2 The casing of an air cooler of an air compressor shall be fitted with a relief valve or a safety diaphragm to provide protection against an air tube bursting.

24.3 An air compressor shall be provided with means for draining water and oil from the inter and discharge stages.

24.4 The air intake for a compressor shall be so located to minimise the induction of oil vapours.

24.5 An air compressor shall be so designed and installed that the temperature of the air delivered from the after cooler does not exceed 93°C.

24.6 A pressure gauge shall be fitted between the after cooler and the compressor I.P. discharge.

### 25. Hydraulic Power Systems

25.1 Hydraulic pumps shall have pressure relief protection on the discharge side which shall operate in closed circuit.

25.2 The materials of hydraulic pumps, motors and accessories shall be compatible with the working fluid. Hydraulic fluid shall be non-flammable or shall have a flash-point of 157°C or over.

25.3 Hydraulic hose shall comply with Australian Standard B226. Installation and fittings shall be in accordance with the manufacturer's requirements.

### 26. Pressure Pipes

#### 26.1 General

26.1.1 Unless specified elsewhere in this Section the requirements of this clause shall apply to pipes the working pressure of which is 700 and over.

26.1.2 The design of steel pipe work shall comply with Australian Standard CB18.

26.2 Copper  
Copper and copper alloy pipes shall be of seamless construction. When pipes other than those of seamless construction are proposed, they will be specially considered by the Fiji Marine Board.

### 26.3 Cooper Pipe Thickness

26.3.1 The minimum thickness of copper and copper alloy pipes shall be determined by the following formula:

$$t = \frac{WP \times d}{2000F - WP} + C$$

where t = wall thickness in mm

WP = working pressure in kPa

d = onside diameter of the tube in mm

f = maximum allowable stress in MPa at the appropriate working temperature (see Table 2.6.3).

c = 0.75 mm

26.3.2 Where copper and copper alloy pipes are to be bent, the thickness as obtained in paragraph 26.3.1 shall be increased by 10 per cent to allow for thinning at the bend. In no case shall the radius of curvature at the centre line of the pipe be less than twice the external diameter of the pipe.

### 26.4 Copper Pipe Heat Treatment

Copper pipes shall be annealed and copper alloy pipes heat treated in accordance with the manufacturers's recommendation.

### 26.5 Reducing Valves

Where a pressure pipe or fitting may receive supply from any source at a higher pressure than that for which the pipe or fitting is designed, an efficient reducing valve shall be fitted. An efficient relief valve of sufficient size together with a pressure gauge shall be fitted on the low pressure side of the reducing valve.

TABLE 26.3

Material	Minimum tensile strength MPa	0.5% Proof stress MPa	Permissible stress MPa										
			50°	75°	100°	125°	150°	175°	200°	225°	250°	275°	300°
Copper	215	62	41	40.5	40	38	32.5	26.5	21.5	..	..	..	..
Aluminium	325	120	69	68.5	67	65	62	42.5	24	..	..	..	..
Brass	275	135	69	68.5	67	65	63.5	60	56	50	43.5	38	..
Copper Nickel			83	80.5	76	72.5	68.5	66	63.5	61.5	59	56.5	54
Nickel 95/5 & 90/10	390	135	83	80.5	76	72.5	68.5	66	63.5	61.5	59	56.5	54
Copper Nickel 70/30			83	80.5	76	72.5	68.5	66	63.5	61.5	59	56.5	54

## PART 4—ELECTRICAL

### 27. Electrical Equipment Extra Low Voltage

27.1 This clause shall apply where the electrical supply does not exceed 32 volts D.C.

27.1.2 Details of electrical power supply arrangements for radio shall comply with requirements of the Radio Equipment Section.

27.1.3 In every installation all necessary precautions shall be taken to limit electrical equipment from affecting navigational aids.

27.1.4 Electrical installations associated with an engine using fuel having a closed flash point of less than 60°C, shall be specially considered by the Authority.

27.2 Distribution

27.2.1 The distribution of electrical power shall be by the two wire insulated system. The use of a hull return for lighting or power distribution is not permitted.

27.2.2 The voltage drop in any circuit shall not exceed 10% of the design voltage. Maximum permissible current ratings shall be in accordance with:

- (a) the cable manufacturer's recommendations; or
- (b) Tables 27.2.2 (A), (B), (C) and (D) or (E) whichever of (A) and (B) gives the least listing.

27.2.3 Circuits supplying two or more final sub-circuits are to be rated in accordance with the total connected load subjects, where justified, to the application of a diversity factor. Where space ways are provided on a main or sub-switchboard or distribution board an allowance for future increases of load is to be added to the total connected load before application of any diversity factor. The diversity factor may be applied to the calculation for size of cable and rating of switch gear and fuse gear.

27.2.4 Final Sub-Circuits

The number of points that may be connected to a final sub-circuit is limited only by the connected load. In determining the connected load, the loading is to be determined as follows:

- (a) the loading of lamp holders is to be taken as:
  - (i) 60 watts of the wattage of the largest lamp which could be inserted, whichever is the greater;
  - (ii) in the case of a fluorescent lamp, the wattage of that lamp;
- (b) the loading of the plug sockets is to be taken as 160 watts or the actual wattage of the appliance to be connected, whichever is the greater;
- (c) the loading of permanently connected appliances is to be taken as the actual wattage of the appliance.

The connected load so determined is not to exceed the rating of the fuse or fuses required to protect the conductors.

Where protection of the final sub-circuit is by a circuit breaker having a fixed over current setting there is no limit to the number of points that may be connected to the circuit having regard both to the suitability of the circuit breaker setting and the maximum permissible current carrying capacity of the cable. Where circuit breakers having adjustable load setting are used, the above limitations of this paragraph shall apply. A separate final sub-circuit is to be provided for every motor required for an essential service.

TABLE 27.2.2A

Conductor	Maximum Current Ratings																						
	Heat resisting Polyvinyl chloride			Ethylene propylene rubber cross-linked Polyethylene chlorosulphonated Polyethylene			Silicone rubber			Mineral insulated metal sheathed													
	1 core	2 core	3 & 4 core	1 core	2 core	3 & 4 core	1 core	2 core	3 & 4 core	1 core	2 core	3 & 4 core											
Standing	Cross section mm <sup>2</sup>	14	11	9	16	13	11	20	17	14	20	17	14	20	17	14	20	17	14	20	17	14	
7/0.4	1.5	19	16	13	22	18	15	24	20	17	24	20	17	24	20	17	24	20	17	24	20	17	14
7/0.5	2.3	25	21	17	28	23	19	32	27	22	32	27	22	32	27	22	32	27	22	32	27	22	17
7/0.67	4	32	27	22	37	31	25	42	36	29	42	36	29	42	36	29	42	36	29	42	36	29	22
7/0.85	6	42	35	29	48	40	33	53	45	37	53	45	37	53	45	37	53	45	37	53	45	37	29
7/1.05	10	58	49	40	67	57	47	73	62	51	73	62	51	73	62	51	73	62	51	73	62	51	37
7/1.35	16	78	66	54	89	75	62	98	83	69	98	83	69	98	83	69	98	83	69	98	83	69	51
7/1.70	25	100	86	71	115	99	82	130	110	91	130	110	91	130	110	91	130	110	91	130	110	91	69
19/1.35	35	120	105	88	145	120	100	165	140	115	165	140	115	165	140	115	165	140	115	165	140	115	91
19/1.73	50	155	135	110	180	155	125	200	175	145	200	175	145	200	175	145	200	175	145	200	175	145	115
19/2.14	70	195	165	135	220	185	155	250	215	175	250	215	175	250	215	175	250	215	175	250	215	175	145
37/1.78	95	235	200	160	270	220	190	310	265	215	310	265	215	310	265	215	310	265	215	310	265	215	175
37/2.03	120	270	230	190	310	265	215	360	305	250	360	305	250	360	305	250	360	305	250	360	305	250	215
37/2.25	150	310	265	215	355	305	250	420	355	290	420	355	290	420	355	290	420	355	290	420	355	290	250
37/2.52	185	355	300	250	405	345	285	485	410	340	485	410	340	485	410	340	485	410	340	485	410	340	290
61/2.25	240	415	355	290	475	405	330	570	485	400	570	485	400	570	485	400	570	485	400	570	485	400	340
61/2.52	300	470	410	335	540	465	380	660	560	460	660	560	460	660	560	460	660	560	460	660	560	460	400
61/2.85	400	570	485	400	650	550	455	800	680	560	800	680	560	800	680	560	800	680	560	800	680	560	460
61/3.20	500	650	550	455	740	630	520	900	770	630	900	770	630	900	770	630	900	770	630	900	770	630	460
127/2.52	630	740	630	520	900	770	630	1100	950	770	1100	950	770	1100	950	770	1100	950	770	1100	950	770	460

Notes: Correction Factors for Current Ratings.

- (i) Where more than six cables are bunched together a derating correction factor of 0.85 is to be applied to the current rating of the cable shown in Table 27.2.2A
- (ii) When it is known that the ambient temperature is other than 45°C the current rating is to be multiplied by the appropriate correction factor as shown in Table 27.2.2C
- (iii) Where the load is intermittent the correction factors shown in Table 27.2.2D are to be multiplied by the current rating of the cable shown in Table 27.2.2A no case is a shorter rating than a one half hour rating to be used.

TABLE 27.2.2B

## INSULATION TEMPERATURE RATINGS

Insulated Material	Maximum Rated Conducted Temp °C
Heat Resisting Polyvinyl Chloride . . . .	75
Ethylene Propylene Rubber . . . . .	85
Cross Linked Polyethylene . . . . .	85
Chlorosulphonated Polyethylene . . . . .	85
Silicone Rubber . . . . .	95
Mineral Insulated Metal Sheathed . . .	95

TABLE 27.2.2C

Insulation	Correction Factor for Ambient Temperature			
	40°C	45°C	50°C	55°C
Polyvinyl Chloride (Heat resisting) . . . . .	1.08	1.00	0.91	0.82
Silicone Rubber . . . . .	1.05	1.00	0.95	0.89
Mineral insulated metal sheathed . . . . .	1.05	1.00	0.95	0.89
Ethylene Propylene Rubber . . . . .	1.06	1.00	0.94	0.87
Cross Linked Polyethylene . . . . .				
Chlorosulphonated Polyethylene . . . . .				

TABLE 27.2.2D

## CORRECTION FACTOR FOR INTERMITTENT SERVICE

Correction Factor	One Half Hour Rating		One Hour Rating	
	With Metallic Sheath	Without Metallic Sheath	With Metallic Sheath	Without Metallic Sheath
1.0 . . . . .	Up to 20 mm <sup>2</sup>	Up to 75 mm <sup>2</sup>	Up to 67 mm <sup>2</sup>	Up to 230 mm <sup>2</sup>
1.1 . . . . .	21 mm <sup>2</sup> -40 mm <sup>2</sup>	76 mm <sup>2</sup> -125 mm <sup>2</sup>	68 mm <sup>2</sup> -170 mm <sup>2</sup>	231 mm <sup>2</sup> -400 mm <sup>2</sup>

TABLE 27.2.2E

## AUTOMOTIVE CABLES COMPLYING WITH AUSTRALIAN STANDARD 2218—CONDUCTOR DETAILS

Area mm <sup>2</sup>	Gauge	Metric standing	Rating
0.85 . . . . .	18	11/0.32	5 amps
1.00 . . . . .	16	14/0.32	10 amps
1.25 . . . . .	16	16/0.32	10 amps
2.00 . . . . .	14	26/0.32	15 amps
3.00 . . . . .	12	41/0.32	20 amps
5.00 . . . . .	10	65/0.32	25 amps

## 27.3 Switchboards

27.3.1 Switchboards shall be constructed using an insulating material that is mechanically strong, non-hygroscopic and non-flammable.

27.3.2 Switchboards should be placed in accessible, adequately ventilated positions, free from flammable gases and acid fumes, and where they are not exposed to the risk of mechanical injury or damages from water.

27.3.3 Switch gear and accessories on main switchboards, sub-switchboards or distribution panels shall be provided with efficient means of identification.

## 27.4 Protection

27.4.1 All conductors, switchgear and accessories are to be of such size and construction as to be suitable for the purpose intended, and capable of carrying, without their respective ratings being exceeded, the maximum in service current.

27.4.2 Enclosures for switchgear and fuse gear, if of a combustible material, shall be lined with non-hygroscopic fire resistant material.

27.4.3 The active conductor or conductors of each individual circuit shall be fitted with overload protection by means of a fuse or circuit breaker.

27.4.4 In a vessel with a metal hull which has overload protection provided in both conductors, the installation shall be provided with lamps or suitable equipment to indicate earth faults.

27.4.5 All electrical equipment should be located in dry, accessible and well ventilated positions and all nuts and screws used in connection with current carrying parts and working parts are to be effectively locked.

## 27.5 Conductors, Cables and Wiring

27.5.1 All conductors of cables between the source of supply and final sub-circuits, with the exception of mineral insulated and metal sheathed cables, and control and instrumentation wiring, are to be of annealed copper of stranded type constructed in accordance with Australian Standard 1125.

27.5.2 Conductors may be insulated by one of the following materials, having regard to the temperature of the space through which they pass:

- Polyvinyl Chloride Compound (P.V.C.) complying with Australian Standards AS 1695 or AS 3147;
- Chlorosulphonated Polyethylene complying with Australian Standard AS 3116;
- Ethylene Propylene Rubber complying with Australian Standards AS 1168

- (d) Mineral complying with Australian Standard AS 3157  
 (e) Silicone Rubber complying with Australian Standard AS 3178; and  
 (f) Crosslinked Polyethylene (XLPE) complying with Australian Standard AS 3198.

27.5.3 All cables unless run in conduit are to have an impervious sheath over the insulating material which may be one of the following:

- (a) Polyvinyl Chloride Compound (P.V.C.) complying with Australian Standards AS 1695 or AS 3147.  
 (b) Polychloroprene (P.C.P.) complying with Australian Standards AS 1168 or AS 3116;  
 (c) Chlorosulphonated Polyethylene complying with Australian Standard AS 1168; or  
 (d) Copper sheath for mineral insulated cable complying with Australian Standard AS 3187.

27.5.4 Flexible cord complying with Australian Standard AS 3191 may be used as fixed wiring subject to compliance with the following:

- (a) the current carrying capacity shall not be less than the current rating or setting of the circuit protective device;  
 (b) the insulation shall have a total thickness at least equivalent to that of an insulated cable of equivalent cross-sectional area;  
 (c) the insulation rating shall be not less than 75°C; and  
 (d) installation shall be in accordance with Table 27.5.4 and provisions 27.6 and 27.1.1.

27.5.5 The minimum internal radius of bend of cable when installed shall be in accordance with the following:

- (a) 6 times the cable diameter for elastomer and PVC sheathed cables exceeding 5 mm overall diameter (without metal covering);  
 (b) 4 times the cable diameter for elastomer and PVC sheathed cable exceeding 9.5 mm and up to 25 mm overall diameter (without metal covering); and  
 (c) 4 times the cable diameter for mineral insulated metal sheathed cable of any diameter.

TABLE 27.5.4

Type of flexible cord	Nominal cross section of conductor	Additional installation requirements
Braided overall	Not smaller than 1 mm <sup>2</sup>	(1) Further enclosure (2) Not permitted for enclosure within appliances
Sheathed, screened and sheathed overall	Not smaller than 1 mm <sup>2</sup>	Nil
Light duty sheathed	Not smaller than 1 mm <sup>2</sup>	(1) Further enclosure (2) Not permitted for enclosure within appliances
Ordinary duty sheathed	Not smaller than 1 mm <sup>2</sup>	Further enclosure
Heavy duty sheathed	No smaller than 1 mm <sup>2</sup>	Nil
Single core unsheathed	Not smaller than 1 mm <sup>2</sup>	Further enclosure

27.5.6 Engine starting cables shall be protected against mechanical damage and kept as short as is compatible with the safe stowage arrangements for the batteries. The cables are not to be placed where they will come into contact with lubricating oil or fuel unless sheathed with an impervious material. Conductors of adequate size shall be taken directly to the starter via the starting relay contacts. The relay is to be mounted directly on the starter or adjacent to it.

### 27.6 Cable Fittings

27.6.1 Trays, cable clips, saddles and fixing screws for the support of cables shall be of corrosion resistant material or be suitably corrosion. Inhibited before installation. The distance between supports is to be in accordance with the requirements of Table 27.6.1 having regard to the type of cable being supported.

27.6.2 When a watertight bulkhead or deck is penetrated the watertight integrity of the bulkhead or deck shall be maintained.

TABLE 27.6.1

### MAXIMUM SPACING OF CABLE SUPPORTS

External diameter of cable in mm	Spacing in mm	
	Non-armoured cables	Armoured cables
Less than 8	200	250
Eight and over but less than 13	250	300
13 and over but less than 20	300	350
20 and over but less than 30	350	400
30 and over	400	450

27.6.3 Where conductors or cables pass through conduits or ducts or through openings formed in metal work the openings are to be of ample size and provided with effective bushes.

27.6.4 Materials used for glands and bushes are to be corrosion resistant.

27.6.5 Where P.V.C. conduit is exposed to risk of mechanical damage effective arrangements are to be provided for its protection.

### 27.7 Navigation Lights

Each navigation light shall be protected in each active conductors by a fuse or circuit breaker. Switches and protective devices for these lights shall be located in the wheel house.

### 27.8 Battery Charging Equipment

There shall be fitted suitable control equipment for generators and batteries including ammeters, isolating switches, voltage regulators cut outs and fuses or circuit breakers.

### 27.9 Fittings in exposed Positions

Plugs and sockets in exposed positions shall be weathertight and sockets has to be provided with blank caps. External sockets shall be at least 300 mm above the deck and be combined with a tube of compatible material to enclose cables passing through the deck.

### 27.10 Insulation Resistance

The insulation resistance between conductors, or conductors and earth, either or the complete installation or any part thereof, measured with all fuse elements in place and all switches closed, shall not be less than 100,000 ohms. This value shall be obtained using a test voltage of not less than twice the supply voltage and not more than 250 volts with appliances, lamps and other consuming devices disconnected. Electronic equipment, which may be damaged during such tests, shall be disconnected.

### 27.11 Installation in Refrigerated Spaces

27.11.1 Cables installed in refrigerated spaces shall have a watertight in refrigerated spaces shall have a watertight and impervious sheath and be protected where necessary against mechanical damage.

27.11.2 PVC conduit shall not be installed in a space where the temperature is likely to fall below 15°C. If metallic conduit is installed it shall be provided with drainage and shall be sealed by a non-setting compound where it passes from the refrigerated to the non-refrigerated space.

27.11.3 Cables entering refrigerated space should pass directly through the walls or lagging. They shall be protected by a tube of compatible material sealed at each end. Alternatively, cables may be passed through solid door frames, the necessary holes being sealed at each end. Sealing compound shall be resilient after setting.

### 27.12 Batteries and Battery Installation

27.12.1 Provision shall be made to electrically isolate the batteries.

27.12.2 Batteries shall be securely mounted so as to prevent movement due to the motion of the vessel. Starting batteries should be located as near as practicable to the engine served and in the case of a propulsion engine not below the level of the starting motor. If installed outside of the machinery space batteries shall be located in a suitable compartment.

27.12.3 Lead acid batteries are to be installed in liquid tight trays not less than 100 mm deep and lined with GRP or other acid resisting material. Alkaline batteries shall be installed on suitable insulating supports and where metal cell container are used these are to be protected against conducting materials that can cause short circuiting between container and container, and between container and the metal structure. Provision shall be made for effective protection of the casings and terminals against the risk of mechanical damage, damage from water or short circuit.

27.12.4 All spaces used for the storage of batteries shall be ventilated to avoid accumulation of flammable gas.

27.12.5 A battery located on the open deck shall be protected from the weather.

27.12.6 All battery terminal connections are to be resistant to the electrolyte. Cable ends at terminals shall be sealed in such a manner as to prevent the entrance of electrolyte.

27.12.7 The ignition and starting system shall be so installed as to minimize the dangers arising from sparking and to eliminate the effects of moisture. In particular starter motor and solenoid terminals shall be covered and protected.

### 28. Electrical Equipment—Low and Medium Voltage

In every installation which is AC or where the DC voltage exceeds 32 the electrical equipment and installation shall be such that the vessel and all persons on board are protected against electrical hazards and shall conform with the relevant provisions of the Regulations for the Electrical and Electronic Equipment of Ships issued by the Institution of Electrical Engineers of the United Kingdom or the relevant provisions of a classification society. All work shall be carried out by electricians recognised by the Authority.

### 29. Emergency Electrical Installation

#### 29.1 General

An emergency source of electrical power shall be self contained.

#### 29.2 Location

29.2.1 Except as provided by paragraph 29.4.2 the emergency source of power including any fuel supply shall be situated outside of the propulsion machinery casing, not forward of the collision bulkhead and be above the uppermost continuous deck.

29.2.2 Subject to the provisions of paragraph 29.4.2 an emergency source of electrical power including any fuel supply shall be so situated within the vessel in relation to the main source of electrical power, that a fire or other casualty occurring in the propulsion machinery space will not interfere with the supply or distribution of emergency power outside that space.

#### 29.3 Operation

The emergency generator and its prime-mover and any emergency accumulator battery shall be so arranged as to ensure that it will operate at full rated power when it is upright and when inclined at any angle of list up to and including 22° either way or up to and including 10° inclination either way in the fore and aft direction, or is in any combination of angles within those limits.

#### 29.4 Type of Power Source

29.4.1 An emergency source of electrical power shall be:

- (a) an accumulator battery; or
- (b) a generator driven by a compression ignition engine.

29.4.2 The emergency source of electrical power in vessels of Classes 3C, 2B less than 50m in length and less than 500 tonnes and 3D and 3E may be the main engine starting batteries.

#### 29.5 Battery

29.5.1 An accumulator battery shall be capable of carrying the total emergency load without recharging or excessive voltage drop for the time specified in the Life Saving Appliances and Radio Equipment Sections, as appropriate for the class and size of vessel.

29.5.2 An accumulator battery shall comply with subclause 27.12 where applicable.

29.5.3 Where a Class 1, 2, 3A or 3B vessel has an emergency source of power from an accumulator battery only, then in the event of failure of the main electrical supply the emergency lighting shall automatically come into operation.

## 29.6 Internal Combustion Engine Prime Mover

### 29.6.1 Fuel for an internal combustion engine shall:

- (a) have a flash point of not less than 60°C; and
- (b) be sufficient for the time specified in the Life-saving Appliances Section, as appropriate for the class and size of vessel and in addition, where an emergency fire pump is supplied with power from an emergency generator, be sufficient for 12 hours full rated operation of the pump.

29.6.2 An emergency generator shall be installed in a space affording protection from the weather and such space shall be adequately ventilated to allow the generator to operate at full power.

### 29.6.3 Starting arrangements shall comply with the following:

- (a) An engine may be hand started;
- (b) Where an engine is not hand started, the starting equipment shall be capable of effecting 12 consecutive cold starts in a period of not more than 30 minutes and where the emergency generator supplies power to an emergency fire pump shall also be capable of effecting 4 cold starts in a period of not more than 10 minutes;
- (c) The consecutive starts required by the preceding sub-paragraph shall be obtained independently of any machinery wiring or other equipment situated:
  - (i) below the bulkhead deck in the case of a passenger vessel or below the uppermost continuous deck in the case of a cargo vessel;
  - (ii) forward of the collision bulkhead;
  - (iii) in the space containing the main source of electrical power; and
  - (iv) in a space which would be rendered inaccessible or uninhabitable by a fire or other casualty in the space containing the main source of electrical power; and
- (d) Where compressed air is used as the sole means of starting an engine then a manually operated air compressor or manual start mechanically driven air compressor unit shall be provided. If only a manual operated compressor is fitted a small air bottle which will provide one start of the engine shall be fitted in addition to the main air receiver for the engine and both shall be capable of being supplied from the vessel's main compressed air system. Where an air receiver for an emergency generator has a supply from the main or auxiliary compressed air system then the air supply line shall be fitted with a non-return valve and the non-return valve shall be located in the emergency generator space.

## 29.7 Temporary Source of Emergency Power

29.7.1 Where a Class 1, 2, 3A or 3B vessel is provided with a generator as an emergency power source then a temporary source of emergency power shall be provided consisting of an accumulator battery of sufficient capacity:

- (a) to supply emergency lighting continuously for half and hour;
- (b) to close the water tight doors (if electrically operated) but not necessarily to close them all simultaneously;
- (c) to operate the indicators (if electrically operated) which give warning that power operated watertight doors are about to close; and
- (d) to operate the sound signals (if electrically operated) which give warning that power operated watertight doors are about to close.

29.7.2 The temporary source of emergency power shall come into operation automatically in the event of failure of the main electrical supply.

## 29.8 Emergency Switchboard

29.8.1 An emergency switchboard forming part of the emergency electrical installation shall be installed as near as practicable to the source of emergency power except that:

- (a) Where a generator is provided as the emergency source of electrical power then the emergency switchboard shall be located in the same space as the generator, unless the operation of the emergency switchboard would be impaired; and
- (b) Where an accumulator battery is provided as the emergency source of electrical power then the battery shall not be installed in the same space as the emergency switchboard.

29.8.2 An emergency switchboard may be supplied from the main switchboard in normal operation.

## 29.9 Items Supplied With Emergency Power

29.9.1 Items required by the Life-saving Appliances Section to be supplied with emergency power are as follows:

- (a) An emergency bilge pump where electrically operated on Class 1, 2, 3A or 3B vessels;
- (b) A watertight door where electrically operated on Class 1, 2, 3A or 3B vessels;
- (c) An indicator which shows whether a power operated door is open or closed and the sound signals which give warning that a power operated door is about to close on Class 1, 2, 3A or 3B vessels;
- (d) A fire protection system which requires electrical power on Class 1, 2, 3A or 3B vessels;
- (e) Emergency lighting for vessels of Class 1 & Class 1B, Class 2 & 50 m or over, Class 3A 50 metres and over, Class 3B 50 metres and over;
- (f) Emergency signals on Class 1, 2, 3A & 3B vessels;
- (g) The Navigation lights on vessels of Class 1, 2, 3A, 3B, & 3C;
- (h) The communication equipment on vessels of Class 1, 2, 3A, 3B, & 3C;
- (i) A day light signalling lamp on vessels of Class 1, 2B & 3C;
- (j) Alarm signal on vessels of Class 2A, Class 3A 50 m and over, Class 3B 50 m and over & Class 3B less than 50 m but not less than 50 tons.

29.9.2 Items required by the Fire Appliance Section to be supplied with emergency power are as follows:

- (a) A fire protection system, fitted on any passenger vessel, in compliance with the Section; and
- (b) An audible gas release alarm fitted to any vessel fitted with a fixed smothering gas installation.

29.9.3 Where a vessel is fitted with an automatic sprinkler system for the protection of an accommodation space, then the sprinkler pump shall be capable of being operated by the emergency supply.



### 29.10 Emergency Lighting

Emergency lighting as required by sub-paragraph 29.9.1 (c) shall be so situated to illuminate:

- (a) service and accommodation alleyways, stairways and exits and personnel lift cars;
- (b) the trunks of personnel lifts, where the lifts are not for use by passengers;
- (c) the machinery spaces and main generating stations including their control positions;
- (d) control stations and all machinery control rooms;
- (e) the stowage positions for firemen's outfits;
- (f) the steering gear;
- (g) sprinkle pumps, emergency fire pumps, emergency bilge pumps and the starting position for the motors of these pumps;
- (h) life boat stations on deck;
- (i) life boats and their launching gear during preparation for and the process of launching, and the water into which the life boats are launched, until the process of launching is completed;
- (j) stowage positions of life rafts for which launching devices are not provided; and
- (k) life rafts and the launching devices for the life rafts during the preparation for and the process of launching the water into which the life rafts are launched until the process of launching is completed.

### 29.11 Lifts

A lift for use by crew or passengers, that is not arranged such that in the event of a main power failure the lift car will come to rest at a normal or emergency exit point, shall be supplied from an emergency source of power which would allow the loaded lift car to be brought abreast of an exit point and the lift car doors to be opened.

## PART 5—LIQUEFIED PETROLEUM GAS INSTALLATION

### 30. Liquefied Petroleum Gas Installation

#### 30.1 Definitions

The following definitions shall apply in this clause.

30.1.1 Liquefied petroleum gas (L.P. gas) is a material which is composed predominantly of any of the following hydrocarbons or mixtures of all of or any of them: propane ( $C_3H_8$ ), propylene ( $C_3H_6$ ), butane ( $C_4H_{10}$ ) or butylene ( $C_4H_8$ ).

30.1.2 High pressure stage is that part of the installation between the valve of the container and the inlet of the pressure regulator.

30.1.3 Low pressure stage is that part of the installation between the outlet of the pressure regulator and the inlet of the appliance, at a pressure not exceeding 3.5 kPa.

30.1.4 Cylinder is a welded or brazed steel vessel, complying with Australian Standard AS 2030 but not exceeding 500 l water capacity and used for the storage and transfer of L.P. gas.

30.1.5 Pressure regulator is a means for maintaining a constant outlet pressure.

30.1.6 Space heater is a self contained sealed combustion gas burning appliance for heating air by secondary conduction of heat from the blue gas through metal to the air.

30.1.7 Pilot is a small flame which is utilised to ignite the gas at the main burner or burners of an appliance.

30.1.8 An L.P. gas appliance is a device which consumes gas for any purpose.

#### 30.2 Appliance Approval

An L.P. gas appliance shall be approved by the Australian Liquefied Petroleum Gas Association (A.L.P.G.A.).

#### 30.3 Installation and Testing

L.P. gas installations and their testing shall be undertaken in accordance with the A.L.P.G.A. Installation Code for Gas Burning Appliances and Equipment by approved persons.

#### 30.4 Piping and Fittings

Piping and fittings shall meet the appropriate requirements of Australian Standard AS 1596 for copper alloy pipes and fittings.

#### 30.5 Cylinder Protection and Fittings

The Cylinder shall be hot dipped galvanised and be provided with a safety relief device and manually operated stop valve. The operating wheel or handle shall be attached at all times to the stop valve on the cylinder.

#### 30.6 Low Pressure Regulators

30.6.1 All systems shall be provided with a regulating device so adjusted as to release gas to the distributing tubing at a pressure not in excess of 3.5 kPa.

30.6.2 A low pressure relief valve shall be integral with the regulator, it shall be set to start to discharge at not less than 2 times and not more than 3 times the delivery pressure.

#### 30.7 Cylinder and Fittings Installation

##### 30.7.1 General

Cylinders, cylinder valves, the high pressure stage and regulating equipment comprising a complete system shall be:

- (a) designed and constructed to withstand a load on the securing devices in any direction equal to 4 times the weight of the cylinder when full;
- (b) installed with the pressure regulator as close as practicable to the cylinder.

The regulator may be mounted on the cylinder valve. If it is not mounted on the cylinder, it shall be fastened firmly to the cylinder supports or otherwise firmly mounted on to the vessel's structure and provision shall be made for ample flexibility in the connection between the cylinder and regulator by means of a loop or loops in the connecting pipe, or by a flexible connection;

- (c) installed so that there is ample flexibility between the regulator and adjacent structure. This shall be achieved by the provision of a loop or loops in the connecting pipe or by the use of a flexible connection where the regulator is mounted directly on the cylinder or cylinder supports.

### 30.7.2 Internal Installation

A cylinder shall not be installed or stored, even temporarily, inside a deckhouse or below decks except:

- for a cylinder which is an integral part of a portable appliance set, provided that the total gas storage capacity of the set does not exceed 4.5 kg; and
- that in partially decked or open boats the Authority may permit cylinder, regulators and associated equipment to be installed in a locker which complies with paragraph 30.7.4.

### 30.7.3 External Installation

A part from cylinders located internally as provided for by paragraph 30.7.2, cylinders, cylinder valves, the high pressure stage and regulating equipment, comprising a complete system shall be:

- substantially secured in a position with the valves uppermost, on the open deck or deckhouse top, outside of enclosures and at a distance of not less than one metre measured horizontally from any opening leading below decks; and
- protected from climatic extremes and if housed, vented to the open air at the top and bottom.

### 30.7.4 Locker Construction

The construction requirements for a locker referred to in paragraph 30.7.2 shall:

- be vapour tight to be interior of the vessel and located above the waterline;
- be lined with fire resistant material;
- be accessible from the top only, and be provided with a vapour tight cover which can be conveniently and quickly opened for operation of cylinder valves and testing of the system for leakage;
- be vented at the bottom by a pipe at least 13 mm inside diameter led directly overboard through the hull to a point lower than the container but not closer than 230 mm to the designed waterline;
- not have electrical connections or wiring within; and
- not be used for any other purpose than housing gas cylinders and regulators.

### 30.8 Piping Arrangement

30.8.1 Pipe work of the low pressure stage shall be of such size that the pressure drop from the regulator or to any appliance shall not exceed 250 Pa with all appliances alight at full gas rate.

30.8.2 The minimum size of pipe used in low pressure stage shall be 4.75 mm outside diameter and 1.0 mm wall thickness.

30.8.3 Where practicable, pipe work shall be continuous and shall enter the vessel's structure directly below or adjacent to the appliance. Branch tees shall be in the main run of pipe and outside the space housing the appliance. Piping shall not go through sleeping accommodation.

30.8.4 No part of an L.P. gas installation shall be installed in or pass through any space containing machinery, explosives or highly combustible substances.

30.8.5 The number of pipe fittings shall be kept to a minimum and sharp changes of direction shall be avoided. All unions, joints, sectional cocks and valves shall be readily accessible.

30.8.6 All piping in the low pressure stage of the system shall be secured against vibration and chafing by nonferrous clips, preferably of the same materials as the pipe. Such clips shall be spaced in accordance with the following table:

MAXIMUM SPACING OF PIPE CLIPS AND SUPPORTS

Nominal of pipe mm	Spacing for vertical runs	Spacing for horizontal runs
	m	m
less than 6.5	1	0.4
6.5 and over	1.25	0.6

In addition, a support shall be provided between 100 mm and 150 mm from any elbow, tee or branch fitting and adequate support shall be provided on pipe bends as close as practicable to each end of the bend.

30.8.7 Where piping passes through a bulkhead or structural member it shall be protected to prevent chafing.

30.8.8 Runs of piping shall be separated from runs of electrical cable and associated fittings. The distance of separation shall, wherever practicable, not be less than 50 mm.

### 30.9 Flame Failure Shut Off

An Appliance shall be fitted with a device which provides an automatic completes shut off of the gas when a pilot light or main burner flame failure occurs. Such appliance shall not be installed below the weather deck without the approval of the Authority.

### 30.10 Ventilation

30.10.1 Spaces containing a gas consuming appliance shall be provided with ventilation openings both top and bottom which cannot be readily closed. The system of ventilation shall provide for the introduction of fresh air and removal of any gas leakage. The minimum area of each ventilation opening shall be 250 mm<sup>2</sup> for each MJ hourly gas consumption rating of the appliance.

30.10.2 Where mechanical ventilation is fitted to any space in which gas containers or gas consuming appliances are situated, the material and design of the fan shall be such as to eliminate incendive sparking due to friction or impact of the fan impeller with the casing. Electric motors driving fans shall be situated outside the space, outside the ventilation trunking and clear of outlets. Alternatively suitably certified flameproof motors may be used if this cannot be achieved. Ventilation outlets shall be in a safe area free from ignition hazard. Mechanical exhaust ventilation trunking shall be led down to the lower part of the space and adjacent to the appliance.

30.10.3 Any gas-consuming appliance shall be so sited in relation to the ventilation system that air turbulence does not bring about the extinction gas flames.

### 30.11 Cooking Stoves

Cooking stoves may, with the approval of the Board be installed below weather deck level and such appliances shall:

- be permanently and securely fastened to a non flammable and non-porous base;
- be installed in positions which are protected from draughts;
- be installed not less than 300 mm from any combustible construction material, unless the surface of that material is protected with sheet asbestos

at least 6.5 mm thick covered with sheet metal and with an air space of at least 6.5 mm between the protected material and the asbestos board; and

(d) have a minimum clearance above the burners of not less than 750 mm.

### 30.12 Refrigerators

A refrigerator shall have a minimum clearance of 50 mm at the back and 300 mm clearance above the appliance unless specifically instructed otherwise by the manufacturer.

### 30.13 Beaters

Space heaters and water heaters with the exception of small single point sink heaters of less than 42 MJ hourly gas consumption shall be of the fully flued type, vented to the outside atmosphere.

### 30.14 Flues

30.14.1 Where flues pass through the sides or top of a space they shall be fitted with a protective sleeve of 6.5 mm asbestos sheeting. Where the structure includes combustible material, a minimum clearance between sleeve and the combustible material of 25 mm shall be provided.

30.14.2 Every flue pipe shall be fitted with a cowl or other suitable means which prevents the ingress of rain. The effective cross sectional area of the flue pipe shall not be less than that of the outlet of the appliances. A flue pipe shall not be fitted with a damper.

30.14.3 Where a manufacturer requires the fitting of a draught diverter to a flued appliance it shall be installed in accordance with his requirements.

### 30.15 Means of Escape

An appliance shall be so located in a space that a fire at the appliance shall not restrict the exit of persons from the space.

### 30.16 Instruction Plate

An instruction plate shall be affixed in a conspicuous position near to one of the appliances. The wording on the instruction plate shall be:

- (a) All appliances must be turned off and cylinder valves closed when vessel is not in use or while refuelling operations are in progress.
- (b) Cylinder valves shall be immediately closed in an emergency.
- (c) Close appliance cocks before opening the cylinder valve.
- (d) Check connections at appliances, regulators and cylinders periodically for leaks with soapy water or its equivalent.
- (e) Never use a match or flame when checking for leaks.
- (f) In the event of a gas leak, immediately stop all engines, shut off all gas appliances and close cylinder valves. Then ventilate the vessel until the air is clear.
- (g) Do not stow empty cylinders in the machinery space.
- (h) In the event of fire, immediately close the cylinder valve.
- (i) Close valve and fit sealing plugs to all spare cylinders not connected, whether full or empty.
- (j) No addition or alterations to the L.P. gas system shall be made without permission from the Authority.
- (k) Crew should familiarise themselves with the odour of unburnt L.P. gas to assist in the early detection of leaks.
- (l) All permanent ventilators, flues and vents should be regularly checked to ensure that they are clear.

31.2.5. Every pressure vessel shall be hydrostatically tested and stamped with identification and other marks.

## PART 6—CARGO REFRIGERATION

### 31. Cargo Refrigeration

#### 31.1 General

31.1.1 Refrigeration units should be of the ammonia or freon compression type. Where it is proposed to use other refrigerants full details shall be submitted. Methyl Chloride shall not be used as a refrigerant. Ammonia shall not be used as a refrigerant on a Class 1 vessel.

31.1.2 A freon plant may be installed in a manned or unmanned machinery space. An ammonia plant shall not be installed in a manned machinery space.

31.1.3 A refrigerated space which a person may be required to enter shall be provided with:

- (a) an alarm which is audible outside the space and which can only be activated and cancelled from within the space;
- (b) means inside the space for locating the exit door, should lights in the space be switched off or fail; and
- (c) means to open every door from both outside and inside the space.

#### 31.2 Cargo Refrigeration

31.2.1 Where a refrigeration machinery space has a boundary common with sleeping accommodation the boundary shall be permanently gastight. Piping shall be arranged so that there can be no direct leakage of refrigerant into an accommodation space.

31.2.2 Each space containing refrigeration machinery shall be provided with ventilation to the outside air either by natural or mechanical means. Where natural ventilation is used the free opening area shall be determined as follows:

$$F = 0.14 \sqrt{G}$$

where F = Free opening area (in m<sup>2</sup>)

G = Mass of the refrigerant charge (in Kg)

Where mechanical ventilation is used the rate of air removal shall be determined as follows:

$$Q = 13.9 \sqrt[3]{G}$$

where Q = the airflow (in l/s)

G = Mass of the refrigerant charge (in Kg)

31.2.3 Unless a vessel with a refrigeration installation carries a breathing apparatus in accordance with the Fire Appliances Section and the apparatus is located in a position unlikely to become inaccessible in the event of leakage of gas, the vessel shall comply with the following sub-paragraphs.

31.2.3.1 A vessel of 25m in length and over in which refrigeration machinery is installed shall be provided with a breathing apparatus which complies with the requirements of the Fire Appliances Section and the apparatus shall be placed in a convenient position not likely to become inaccessible in the event of leakage of gas.

31.2.3.2 A vessel of less than 25m in length in which ammonia refrigeration machinery is installed shall be provided with a cannister respirator which complies with the requirements of SAA Z18 and the respirator shall be placed in a convenient position not likely to become inaccessible in the event of leakage of gas.

31.2.4 Unless otherwise specified in this Part a refrigeration system shall be designed, constructed and tested in accordance with the appropriate provisions of Australian Standard AS1677.

31.2.6 The tests required by paragraphs 31.2.4 and 31.2.5 shall be carried out to the satisfaction of a person recognized by the Fiji Marine board.

31.2.7 In addition to the requirements of Australian Standard AS1210 with regard to pressure vessel supports, no pressure vessel is to be used as a support for other pressure vessels and/or machinery or piping, except with the approval of the Fiji Marine Board.

31.2.8 An ammonia refrigeration installation shall comply with the following sub-paragraphs.

31.2.8.1 All electrical equipment on or adjacent to the installation shall conform to the requirements prescribed in Australia Standard AS3000, Part 1 for electrical installations in hazardous locations.

31.2.8.2 Flame producing devices and hot surfaces above 400°C shall be located as remotely as practicable from the installation.

31.2.8.3 Unless the space containing the refrigeration installation is protected in accordance with the provisions of Australian Standard AS1482, equipment shall be surrounded by fixed water sprays directed at all potential leak sources such as pipe connections, flanges and compressors. Supply of water to the sprays shall be controllable from outside the space containing the equipment.

31.2.8.4 A purge valve shall be fitted which is operable from outside the machinery space and discharges to the sea.

#### PART 7—PERSONNEL PROTECTION

##### 32. Machinery Space Safeguards

###### 32.1 General

Machinery shall be so arranged and protected as to safeguard personnel from hazard.

###### 32.2 Passage Widths

In the engine room of a vessel of 20m in length and over, passages of not less than 600 mm, should be provided between engines and auxiliary machinery or switchboards.

###### 32.3 Gratings and Floor Plates

32.3.1 Gratings in a machinery space shall be provided with a handrail and guard rail where necessary. The boards approximately 60 mm high should be fixed to the edge of all gratings where appropriate. Floor plates shall be properly fitted and secured in place and have a non-slip surface.

32.3.2. Openings to machinery space bilges shall be guarded where necessary.

###### 32.4 Ladders

Machinery space ladders shall be fitted with rungs or non-slip treads and have adequate hand rails.

###### 32.5 Moving Machinery Guarding

Engines, electric motors, gearing, chain and belt drives, friction clutches and shafting which may cause injury to persons shall be fitted with guards where necessary.

###### 32.6 Thermal Protection

Exhaust piping and other hot surfaces shall be properly insulated or otherwise protected where necessary.

## LIFE SAVING APPLIANCES

### CONTENTS

1. This Section is divided into Parts as follows:

- PART 1 — PRELIMINARY (CLAUSE 2)
- PART 2 — GENERAL PROVISIONS (CLAUSES 3—9)
- PART 3 — SCALES OF LIFE-SAVING APPLIANCES
- PART 4 — TYPES OF LIFE-SAVING APPLIANCES (APPENDICES A—N)

#### PART 1—PRELIMINARY

2. This Section should be read in conjunction with the Introduction, Definition and General Requirements Section.

#### PART 2—GENERAL PROVISIONS

Scales of Life—saving Appliances:

3.1 The scale of equipment to be provided in each class of vessel shall comply with the requirements detailed in Part 3 of this Section.

4. Types of Life—saving Appliances:

4.1 All items of equipment listed in Part 3 are subject to the approval of the Fiji Marine Board and must conform to the standards detailed in the Appendices to this Section.

5.1 Lifeboats:

5.1.1 Lifeboats shall be identified by being numbered consecutively commencing from the forward lifeboats, each number being prefixed by the letter 'P' for lifeboats on the port side, and the letter 'S' for lifeboats on the starboard side. The identifying letters and numbers shall be clearly painted on the bluff of each bow and the inboard quarter of the lifeboat as stowed.

5.1.2 The dimensions of a lifeboat, its cubic capacity and its carrying capacity shall be clearly and permanently marked on the lifeboat.

5.1.3 The name and port of registry of the vessel shall be clearly painted on each side of the bow of each lifeboat.

5.2 Inflatable Liferrafts:

5.2.1 Each inflatable liferaft shall be clearly and permanently marked with a serial number and the manufacturer's name.

5.2.2 The carrying capacity of an inflatable liferaft shall be clearly and permanently marked on the liferaft and on the valise or other container in which the liferaft is contained.

5.3 Buoyant Apparatus and Appliances:

5.3.1 The carrying capacity of buoyant apparatus and appliances shall be clearly and permanently marked upon them.

5.3.2 The name and port of registry of the vessel shall be clearly painted on buoyant apparatus and appliances.

#### 5.4 Lifebuoys:

5.4.1 The name and port of registry of the vessel shall be clearly painted on a lifebuoy.

#### 5.5 Lifejackets:

5.5.1 Lifejackets shall be marked as prescribed in Appendices H and I of this Section.

#### 5.6 Approved Boat:

5.6.1 The carrying capacity of an approved boat shall be clearly and permanently marked upon it.

5.6.2 The name and port of registry of the vessel shall be clearly painted on the boat.

#### 6. Stowage of Life-saving appliances:

##### 6.1 Lifeboats:

6.1.1 Lifeboats shall be stowed in such a manner that:

- (a) with a full complement of crew and equipment they can be put in the water safely in not more than 30 minutes, even when the trim of the vessel is 10 degrees and the vessel is listed 15 degrees either way (except in the case of lifeboats launched by single davits, where a launching crew only is required);
- (b) they will not impede the rapid handling of another lifeboat, dinghy, liferaft or buoyant apparatus; and
- (c) they will not impede the marshalling of passengers to their muster stations and their embarkation into life-saving appliances.

6.1.2 A lifeboats shall not be carried:

- (a) in the bows of a vessel;
- (b) near the propeller of a vessel; or
- (c) near the steeply overhanging portions of the hull aft.

6.1.3 Each lifeboat shall be attached to a separate set of davits or davit.

6.1.4 A lifeboat shall be stowed so that, as far as it is practicable, the lifeboat is capable of being launched down the straight side of the vessel.

6.1.5 Means shall be provided for illuminating the life-boats and the launching gear during preparations for launching and for illuminating the water into which the lifeboats are launched.

##### 6.2 Liferrafts:

6.2.1 Liferrafts shall be carried in such a manner that:

- (a) the liferafts can be put in the water safely in not more than 30 minutes, even when the trim of the vessel is 10 degrees and the vessel is listed 15 degrees either way;
- (b) will enable the liferafts that are not attached to launching devices to float free in the event of the vessel sinking;
- (c) will not impede the rapid handling of another liferaft, lifeboat, approved boat or buoyant apparatus; and
- (d) will not impede the marshalling of passengers to their muster stations and their embarkation into lifesaving appliances.

6.2.2 Liferrafts that are to be launched from fixed launching devices shall be carried so that they can be launched with a full complement of persons and equipment, but they shall not be stowed:

- (a) in the bows of a vessel;
- (b) near the propeller of a vessel; or
- (c) near the steeply overhanging positions of the hull aft.

6.2.3 A liferaft shall be stowed so that, as far as it is practicable, the liferaft is capable of being launched down the straight side of the vessel.

6.2.4 Means shall be provided for illuminating the stowage position of a liferaft.

6.2.5 Where liferafts are to be launched from fixed launching devices, means shall be provided for illumination of the launching gear during preparation for launching and for illuminating the water into which the liferafts are launched.

##### 6.3 Buoyant Apparatus and Appliances:

6.3.1 A buoyant apparatus/appliance shall be carried in such a manner that the apparatus/appliance can be put into water even when the trim of the vessel is 10 degrees and the vessel is listed 15 degrees either way.

6.3.2 A buoyant apparatus/appliances shall be stowed so that the apparatus will not impede the rapid handling of any lifeboat, approved boat, liferaft or other buoyant apparatus/appliance.

6.3.3 Means shall be provided for illuminating the stowage position of buoyant apparatus/appliances.

#### 6.4 Approved Boat:

6.4.1 An approved boat shall be carried in such a manner that the boat can be put into the water, even when the trim of the vessel is 10 degrees and the vessel is listed 15 degrees either way.

6.4.2 An approved boat shall be stowed so that the boat will not impede the rapid handling of any lifeboat, liferaft, buoyancy apparatus or other approved boat.

6.4.3 Means shall be provided for illuminating the stowage position of an approved boat.

#### 6.5 Lifebuoys:

6.5.1 A lifebuoy shall be stowed:

- (a) in such a manner that it not permanently secured in any way;
- (b) so as to be readily accessible to all persons on board; and
- (c) so as to be rapidly cast loose.

6.5.2 Where practicable, two lifebuoys with self-igniting lights and smoke signals attached shall be stowed so as to be capable of quick release from the navigation bridge.

#### 6.6 Lifejackets:

6.6.1 Lifejackets shall be stowed so as to be easily located by, and readily accessible to, the persons for whose use they are intended and such stowage shall be clearly marked.

6.6.2 On vessels of over 50m length additional lifejackets shall be stowed in or adjacent to service and machinery spaces where persons are required to remain on duty in an emergency.

#### 6.7 Portable Radio Equipment:

6.7.1 Portable radio equipment shall be stowed in such a place that the equipment is readily accessible from the open deck of vessel and is ready to be moved into a lifeboat or liferaft in the event of an emergency.

6.7.2 The portable radio equipment shall not be stowed in the radiotelegraphy room of a vessel.

#### 7. Survey of Inflatable Liferrafts:

7.1 The survey of an inflatable liferaft shall be carried out at the place in which it was manufactured or at an approved place.

7.2 Surveys of inflatable liferafts shall be carried out at intervals of not more than twelve (12) months provided that, where such an arrangement is impracticable, the interval may be extended by a period not exceeding three (3) months subject to the approval of the Fiji Marine Board.

#### 8. Pyrotechnic and Smoke Signals:

8.1 All pyrotechnic and smoke signals shall be properly packed and stowed and maintained in good condition at all times.

8.2 Subject to the above requirement, pyrotechnic and smoke signals may be accepted as complying with the requirements of this Section for the following periods:

- (a) Calcium Carbide Lifebuoy Lights  
—2 years from date of manufacture;
- (b) Ship and Lifeboat/Liferaft Pyrotechnics  
—3 years from date of manufacture;
- (c) Lifebuoy Smoke Signals  
—3 years from date of manufacture; and
- (d) Lifeboat buoyant smoke signals may be accepted for an indefinite period provided that they remain in good condition.

#### 9. Embarkation into Lifeboats and Liferrafts:

##### 9.1 Ladders:

9.1.1 A vessel shall be furnished at each set of lifeboat davits with a ladder which is long enough to reach the lifeboats when afloat at the vessel's lightest sea-going draught. Additional ladders to facilitate embarkation into the liferafts when afloat shall also be provided. (The Fiji Marine Board may exempt any vessel from the requirements of this Clause where it is satisfied that to require compliance therewith would be unreasonable on account of the freeboard of the vessel concerned or the stowage position of the lifeboats of liferafts).

##### 9.2 Engine Room Discharge:

9.2.1 A vessel shall be furnished with means, capable of being controlled from outside the engine room, to prevent any discharge of water into:

- (a) lifeboats when being launched; and
- (b) liferafts when being launched from fixed launching devices.

## PART 3—SCALES OF LIFE-SAVING APPLIANCES

(Note: The following scales apply to vessels other than Safety Convention Vessels. (CLASS 1 AND CLASS 2A)

## CLASS 2B—VESSELS ENGAGED ON INTERNATIONAL VOYAGES (EXCEPT TANKERS)

Measured Length	L.S.A. Requirements
70 Metres and over	<p><b>LIFEBOAT AND LIFERAFTS</b></p> <p>SOLAS lifeboat(s) for 100% complement on each side of vessel, plus, SOLAS liferafts for 100% complement; plus, in vessels for more than 150 metres in length with no superstructure amidships, one SOLAS liferaft sufficient to accommodate at least six persons</p> <p>Either:</p> <p>(1) SOLAS lifeboats for 100% complement on each side of vessel, plus, SOLAS liferaft(s) for 100% complement; or</p> <p>(2) one SOLAS lifeboat for 100% complement capable of being launched from either side of the vessel, plus, SOLAS liferafts for 100% complement; or</p> <p>(3) At least two SOLAS liferafts for a total capacity of 100% complement, plus, an approved boat capable of being launched on one side of the vessel.</p> <p>SOLAS liferaft(s) for 100% complement, plus, an approved boat.</p>
50 metres and over but less than 70 metres	
30 metres and over but less than 70 metres	
10 metres and over but less than 30 metres	SOLAS liferaft(s) for 100% complement.
(a) 70 metres and over, or (b) less than 70 metres but not less than 1600 tons	<p><b>MOTOR LIFEBOATS</b></p> <p>One of the above lifeboats is to be a motor lifeboat</p>

Measured Length	L.S.A. Requirements
All lengths	<p><b>PORTABLE RADIO EQUIPMENT</b></p> <p>One portable radio suitable for use in lifeboats or liferafts.</p>
30 metres and over	<p><b>LIFEBUOYS</b></p> <p>6 lifebuoys At least two to have self-igniting lights. Two of</p> <p>4 lifebuoys remainder fitted with buoyant lines.</p>
10 metres and over but less than 30 metres	
All lengths	<p><b>LIFEJACKETS</b></p> <p>(1) A SOLAS lifejacket with a whistle for each person of mass of 32 kg and over that the vessel is certified to carry, to be stowed in the accommodation</p> <p>plus</p> <p>(2) A SOLAS lifejacket suitable for each person aboard the vessel of mass of less than 32 kg.</p> <p>plus.</p> <p>for vessels over 50 m length</p> <p>(3) 5 % additional SOLAS lifejackets with whistles of which a sufficient number shall be placed in or adjacent to service and machinery spaces.</p>
Vessels over 50 metres length (Additional)	
45 metres and over	<p><b>LINE THROWING APPLIANCES</b></p> <p>One line throwing appliance with 4 rockets and lines.</p>
All lengths	<p><b>DISTRESS</b></p> <p>6 parachute distress rockets 4 red hand flares 2 hand held orange smoke signals.</p>

Measured Length	L.S.A. Requirements								
30 Metres and over	<p align="center"><b>ELECTRIC ALARM SIGNAL</b></p> <p>Electrically—operated alarm signals controlled from the normal navigating position for summoning passengers (if any) and crew to their muster-stations.</p>								
(a) 50 metres and over,	<p align="center"><b>EMERGENCY ELECTRICAL INSTALLATION/EQUIPMENT</b></p> <p>A self-contained emergency electrical installation, in addition to the main generating set, able to simultaneously operate emergency lighting, alarm signals, navigation lights and communications equipment and capable of continuous operation for:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 80%;">(1) vessels 125 metres and over,</td> <td rowspan="2" style="font-size: 3em; vertical-align: middle;">}</td> <td rowspan="2" style="vertical-align: middle;">6 hrs</td> </tr> <tr> <td style="text-align: center;">or</td> </tr> <tr> <td>(2) less than 125 metres, but not less than 5000 tons</td> <td rowspan="2" style="font-size: 3em; vertical-align: middle;">}</td> <td rowspan="2" style="vertical-align: middle;">3 hrs</td> </tr> <tr> <td>(3) less than 125 metres and less than 5000 tons</td> </tr> </table>	(1) vessels 125 metres and over,	}	6 hrs	or	(2) less than 125 metres, but not less than 5000 tons	}	3 hrs	(3) less than 125 metres and less than 5000 tons
(1) vessels 125 metres and over,	}	6 hrs							
or									
(2) less than 125 metres, but not less than 5000 tons	}	3 hrs							
(3) less than 125 metres and less than 5000 tons									
Less than 50 metres and less than 500 tons	<p>(1) a number of electric torches or hand lamps as determined by the Fiji Marine Board;</p> <p>(2) an emergency installation capable of operating navigation lights (where they are solely electric) for 3 hours, and</p> <p>(3) an emergency installation capable of operating signalling lamps (where they are normally operated from main electric power source) and communication equipment for 3 hours.</p> <p>Note: In relation to (2) and (3) above the emergency installation can be the normal starting batteries provided that they are suitably placed in the vessel.</p>								

Measured Length	L.S.A. Requirements
All lengths	<p align="center"><b>PROVISION OF PAIN-KILLING DRUGS</b></p> <p>There shall be carried in the vessel a quantity of pain-killing drugs for use in lifeboats and/or liferafts which shall be additional to any drugs carried pursuant to the Miscellaneous Equipment Section.</p> <p>The quantity to be carried shall be as follows:</p> <p>For each 15 persons or part thereof on board the vessel one pack containing:</p> <p>(a) 5 doses of Morphine Sulphate injection 15 mg in 1ml disposable syringes; or</p> <p>(b) 5 doses for Morphine Sulphate injection 15 mg in 1ml together with one suitable sterile disposable syringe complete with needle; or</p> <p>(c) 6 doses of Omnopon Tubunic 30 mg.</p> <p>The drugs shall be stowed in a secure manner in an accessible position in the space from which the vessel is normally navigated.</p>
	<p>There shall be included on the Emergency Station List provision for a responsible member of the crew to remove the pain-killing drugs to the lifeboats and/or liferafts. The distribution of the drugs shall be at the discretion of the Master.</p>
All lengths	One copy of the Rescue Signal Table.



Measured Length	L.S.A. Requirements
(1) 50 metres and over	<p><b>LIFEBOATS AND LIFERAFTS</b></p> <p>SOLAS lifeboat(s) for 100% complement on each side of vessel</p> <p>plus</p> <p>SOLAS liferafts for 100% complement</p> <p>plus</p> <p>(for vessels of more than 150 metres in length with no superstructure amidships) one SOLAS liferaft sufficient to accommodate at least six persons.</p> <p>SOLAS lifeboat(s) for 100% complement on each side of the vessel</p> <p>plus</p> <p>SOLAS liferafts for 100% complement.</p> <p>Either</p> <p>(1) SOLAS lifeboat(s) and liferaft(s) as above, or</p> <p>(2) A SOLAS lifeboat for 100% complement capable of being launched from either side of vessel</p> <p>plus</p> <p>SOLAS liferaft(s) for 50% complement.</p>
(2) Less than 50 metres but not less than 500 tons	
(3) Less than 50 metres and less than 500 tons	
(1) 70 metres and over, or (2) Less than 70 metres but not less than 1600 tons	<p><b>MOTOR LIFEBOATS</b></p> <p>One of the above lifeboats on each side of vessel is to be a motor lifeboat.</p>
All lengths	<p><b>PORTABLE RADIO EQUIPMENT</b></p> <p>One portable radio suitable for use in lifeboats and liferafts.</p>

Measured Length	L.S.A. Requirements
60 metres and over	<p><b>LIFEBUOYS</b></p> <p>8 lifebuoys } At least 50% to have self-igniting lights</p> <p>6 lifebuoys } including 2 with smoke signals.</p> <p>4 lifebuoys } 2 of remaining lifebuoys to be fitted with buoyant lines.</p> <p>2 lifebuoys, one with light and one with line.</p> <p>1 lifebuoy with light.</p> <p>Note: All self-igniting lights to be electric battery type.</p>
45 metres and over but less than 60 metres	
30 metres and over but less than 45 metres	
15 metres and over but less than 30 metres	
Less than 15 metres	
All lengths	<p><b>LIFEJACKETS</b></p> <p>(1) A SOLAS lifejacket with a light and whistle for each person of mass of 32 kg and over that the vessel is certified to carry, to be stowed in the accommodation</p> <p>plus</p> <p>(2) 100% additional SOLAS lifejackets with lights and whistles of which a sufficient number shall be placed in or adjacent to service and machinery spaces and the balance remaining to be stowed in float-free lockers adjacent to the lifeboat/liferaft muster stations</p> <p>plus</p> <p>(3) A SOLAS lifejacket suitable for each person aboard the vessel of mass of less than 32 kg.</p>

Measured Length	L.S.A. Requirements
50 metres and over	<p><b>LINE THROWING APPLIANCES</b></p> <p>One line throwing appliance with 4 rockets and lines.</p>
30 metres and over Less than 30 metres	<p><b>DISTRESS SIGNALS</b></p> <p>12 parachute rockets 6 parachute rockets 4 red hand flares 2 hand held orange smoke signals.</p>
30 metres and over	<p><b>ELECTRIC ALARM SIGNAL</b></p> <p>Electrically-operated alarm signals controlled from the normal navigating position for summoning passengers (if any) and crew to their muster stations.</p>
(a) 50 metres and over, or (b) Less than 50 metres but not less than 500 tons	<p><b>EMERGENCY ELECTRICAL INSTALLATION/EQUIPMENT</b></p> <p>A self-contained emergency electrical installation in addition to main generating set able to simultaneously operate emergency lighting, alarm signals, navigation light and communication equipment and capable of providing continuous operation for:</p> <p>(1) Vessels 125 metres and over, } or } 6 hrs (2) Less than 125 metres but not less than 5000 tons } (3) Less than 125 metres and less than 5000 tons } 3 hrs</p>

Measured Length	L.S.A. Requirements
Less than 50 metres and less than 500 tons	<p>(1) a number of electric torches or hand lamps as determined by the Fiji Marine Board</p> <p>(2) an emergency installation capable of operating navigation lights (where they are solely electric) for 3 hours and</p> <p>(3) an emergency installation capable of operating signalling lamps (where they are normally operated from main electric power source) and communication equipment for 3 hours.</p> <p>Note: In relation to (2) and (3) above the emergency installation can be the normal starting batteries provided that they are suitably placed in the vessel.</p>
All lengths	<p><b>PROVISION OF PAIN—KILLING DRUGS</b></p> <p>There shall be carried in the vessel a quantity of pain-killing drugs for use in lifeboats and/or liferafts which shall be additional to any drugs carried pursuant to the Miscellaneous Equipment Section.</p> <p>The quantity to be carried shall be as follows:</p> <p>For each 15 persons or part thereof onboard the vessel one pack containing:</p> <p>(a) 5 doses of Morphine Sulphate injection 15 mg in 1 ml disposable syringes; or</p> <p>(b) 5 doses of Morphine Sulphate injection 15 mg in 1 ml ampoules together with one suitable sterile disposable syringe complete with needle; or</p> <p>(c) 6 doses of Omnopon Tubunic 30 mg.</p> <p>The drugs shall be stowed in a secure manner in an accessible position in the space from which the vessel is normally navigated.</p> <p>There shall be included on the Emergency Station List provision for a responsible member of the crew to remove the pain-killing drugs to the lifeboats and/or liferafts. The distribution of the drugs shall be at the discretion of the Master.</p>
All lengths	One copy of the Rescue Signal Table.

**VESSELS—RESTRICTED PACIFIC REGION TRADE**  
(Restricted to operations of vessels between Rotuma and any other Port or Place in Fiji)

Measured Length	L.S.A. Requirements
All lengths	<p><b>LIFEBOATS, APPROVED BOATS AND LIFERAFTS</b></p> <p>Either:</p> <p>(1) SOLAS lifeboats for 100% complement on each side of vessel, plus SOLAS life rafts for 25 % complement, or</p> <p>(2) Approved boat(s) and SOLAS liferafts for 100% complement, or</p> <p>(3) SOLAS liferafts for 100% complement.</p>
All lengths	<p><b>PORTABLE RADIO EQUIPMENT</b></p> <p>One portable radio suitable for use in lifeboats or liferafts or one approved EPIRB.</p>
<p>70 metres and over</p> <p>30 metres and over but less than 70 metres</p> <p>10 metres and over but less than 30 metres</p>	<p><b>LIFEBUOYS</b></p> <p>8 } at least 2 to have self-igniting</p> <p>6 } lights</p> <p>4 } Two of remainder fitted with buoyant lines</p>
All lengths	<p><b>LIFEJACKETS</b></p> <p>(1) A SOLAS lifejacket with a whistle for each person of mass of 32 kg and over that the vessel is certified to carry, to be stowed in the accomodation</p> <p>plus</p> <p>(2) A SOLAS lifejacket suitable for each person aboard the vessel of mass less than 32 kg.</p>

Measured Length	L.S.A. Requirements
	<p>plus</p> <p>(1) 5% additional SOLAS lifejackets with whistles of which a sufficient number shall be placed in or adjacent to service and machinery spaces.</p>
30 metres and over	<p><b>LINE THROWING APPLIANCES</b></p> <p>One line throwing appliances with 4 rockets and lines.</p>
<p>30 metres and over</p> <p>Less than 30 metres</p>	<p><b>DISTRESS SIGNALS</b></p> <p>6 parachute distress rockets</p> <p>4 red hand flares</p> <p>2 hand held or orange smoke signals</p> <p>3 parachute distress signals</p> <p>2 red hand flares</p> <p>1 hand held orange smoke signal</p>
30 metres and over	<p><b>ELECTRICAL ALARM SIGNAL</b></p> <p>Electrically operated alarm signals controlled from the normal navigating position for summoning passengers (if any) and crew to their muster stations.</p>
All lengths	<p><b>EMERGENCY ELECTRICAL INSTALLATION</b></p> <p>A self-contained emergency electrical installation, in addition to main generating set, able to simultaneously operate emergency bile pump (where electrically operated), watertight doors (where electrically operated), indicators and sound signals for power-operated doors, fire protection system, emergency lighting, emergency signals, navigation lights and communications equipment and capable of providing continuous operation for 12 hours.</p>
All lengths	<p>One copy of the Rescue Signal Table</p>

## CLASS 3B AND CLASS 3C

## FIJI ISLANDS TRADE AND SEA GOING SERVICE

Measured Length	L.S.A. Requirements
All lengths	<p><b>APPROVED BOATS, INFLATABLE LIFERAFTS AND BUOYANT APPARATUS</b></p> <p>Either:</p> <p>(1) Approved boats for 100% complement, or</p> <p>(2) Buoyant apparatus for up to 40% complement to a maximum of 40 persons, and</p> <p>Approved boats for the remainder. Inflatable liferafts may be substituted for the approved boats.</p>
50 metres and over 30 metres and over but less than 30 metres 10 metres and over but less than 30 metres	<p><b>LIFEBUOYS</b></p> <p>6 lifebuoys } At least 2 with self-igniting 4 lifebuoys } lights, 2 of remainder fitted                   } with buoyant lines</p> <p>3 lifebuoys } 2 with lights,                   } 1 with buoyant line.</p>
All lengths	<p><b>LIFEJACKETS</b></p> <p>(1) A Coastal lifejacket for each person of mass of 32 kg and over that the vessel is certified to carry, plus (2) A Coastal lifejacket suitable for each person aboard the vessel of mass of less than 32 kg, plus (3) 5% of (1) stowed in or adjacent to service and machinery spaces (each crew lifejacket shall be fitted with a whistle).</p>

Measured Length	L.S.A. Requirements
30 metres and over Less than 30 metres	<p><b>DISTRESS SIGNALS</b></p> <p>6 parachute distress rockets 4 red hand flares 2 hand held orange smoke signals</p> <p>3 parachute distress rockets 2 red hand flares 1 hand held orange smoke signal.</p>
50 metres and over	<p><b>LINE THROWING APPLIANCE</b></p> <p>Line throwing appliance with 4 rockets and lines.</p>
30 metres and over	<p><b>ELECTRICAL ALARM SIGNAL</b></p> <p>Electrical alarm signal for mustering crew and passengers (where efficient mustering cannot be carried out by voice).</p>
All lengths	<p><b>EMERGENCY ELECTRICAL INSTALLATION</b></p> <p>A self-contained emergency electrical installation, in addition to main generating set, able to simultaneously operate emergency bilge pump (where electrically operated), watertight doors (where electrically operated), indicators and sound signals for power operated doors, fire protection system, emergency lighting, emergency signals, navigation lights and communications equipment and capable of providing continuous operation for 12 hours (For voyages of sort duration, a shorter period of continuous operation may be permitted by the Fiji Marine Board).</p>
All lengths	<p>One copy of the Rescue Signal Table.</p>

## CLASS 3D

## SHORT COASTING SERVICE

Measured Length	L.S.A. Requirements
All lengths	<p><b>APPROVED BOATS, INFLATABLE LIFERAFTS AND BUOYANT APPARATUS</b></p> <p>(1) Approved boats for 100% complement, or</p> <p>(2) Buoyant apparatus for upto 40% complement to a maximum of 40 persons, and</p> <p>Approved boats for the remainder. Inflatable liferafts may be substituted for the approved boats and buoyant apparatus.</p>
50 metres and over	<p><b>LIFEBUOYS</b></p> <p>6 lifebuoys } At least 50% with self-igniting lights</p> <p>4 lifebuoys } 2 with buoyant lines</p> <p>3 lifebuoys } 2 with lights, 1 with buoyant line.</p>
30 metres to less than 50 metres	
10 metres to less than 30 metres	
All lengths	<p><b>LIFEJACKETS</b></p> <p>A Sheltered Waters Lifejacket for each person the vessel is certified to carry.</p>
All lengths	<p><b>DISTRESS SIGNALS</b></p> <p>3 parachute distress rockets</p> <p>3 red hand flares</p> <p>1 hand held orange smoke signal</p> <p>(A reduction in distress signals may be permitted by the Fiji Marine Board consistent with the area of operations allocated to the vessel).</p>

Measured Length	L.S.A. Requirements
30 metres and over	<p><b>ELECTRICAL ALARM SIGNAL</b></p> <p>Electric alarm signal for mustering crew and passengers (where sufficient mustering cannot be carried out by voice).</p>
All lengths	<p><b>EMERGENCY ELECTRICAL EQUIPMENT</b></p> <p>A number of electric torches or hand lamps as determined by the Fiji Marine Board.</p>
All lengths	One copy of the Rescue Signal Table.

## CLASS 3E

## HARBOURS AND RIVER SERVICE

Measured Length	L.S.A. Requirements
All lengths	<p><b>APPROVED BOATS, INFLATABLE LIFERAFTS AND BUOYANT APPARATUS</b></p> <p>(1) An approved boat for 60% of complement, or</p> <p>(2) One approved boat and buoyant apparatus which together provide for 60% of complement</p> <p>An inflatable liferaft may be substituted for the approved boat and buoyant apparatus.</p>
All lengths	<p><b>LIFEBUOYS</b></p> <p>2 lifebuoys, 1 with light and 1 with line</p>
All lengths	<p><b>DISTRESS SIGNALS</b></p> <p>3 parachute distress rockets</p> <p>3 hand flares</p>
All lengths	<p><b>EMERGENCY ELECTRICAL EQUIPMENT</b></p> <p>Electric torches and hand lamps as determined by the Fiji Marine Board.</p>
All lengths	<p><b>LIFEJACKETS</b></p> <p>A Sheltered Waters Lifejacket for each person the vessel is certified to carry.</p>

## PART 4—TYPES OF LIFESAVING APPLIANCES

## APPENDICES:A--N

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## APPENDIX A

## APPROVED BOATS

## 1. Construction and Capacity:

1.1 Every approved boat shall be an open boat constructed with rigid sides, or an inflatable boat of a design type approved by the Fiji Marine Board.

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 it is licensed to carry.

1.3 The maximum number of persons the boat is certified to carry shall be calculated as follows:

$$\text{No.} = \frac{A}{0.372} \quad \text{Where A is the surface area in the boat available to persons sitting no higher than the thwarts;}$$

OR,

The number of persons for which the boat is successfully swamp tested according to sub clause 3,

whichever is the less number.

1.4 The length of the boat shall be not less than 3.0 metres, nor more than 6.0 metres.

1.5 All thwart and side seats in the boat shall be fitted as low in the boat as practicable, and bottom boards shall be fitted in rigid boats.

1.6 The boat may be square-sterned and shall have a mean sheer at least equal to five per cent of its length.

1.7 The boat shall be fitted with internal buoyancy appliances which shall be so placed as to secure stability when the boat is fully loaded under adverse weather conditions.

1.8 Every boat shall be fitted with internal buoyancy appliances which shall consist either of air cases or of buoyant material or inflatable tubes of an approved design such that damage to one tube will not prevent the boat from maintaining the minimum buoyancy and stability required.

1.9 The total volume of the internal buoyancy appliances shall be such that it will float the boat its total personnel 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.

1.10 The centre of mass of the buoyancy shall be situated above the flooded centre of Gravity of the boat.

## 2. Equipment:

An approved boat shall be equipped with:

2.1 A single complement of buoyant oars and one spare buoyant oar provided that there shall never be less than three oars; one set of crutches attached to the boat by lanyard or chain.

2.2 Two plugs for each plug hole (except where proper automatic valves are fitted) attached to the boat by lanyards or chains; a bailer; one anchor and 20 metres of anchor line.

2.3 A painter of sufficient length and size secured to the forward end of the boat.

2.4 A line becketed to the gunwale to enable persons to cling to the boat if upturned or upright.

2.5 One litre of fresh water for each person in the carrying capacity of the lifeboat.

2.6 Two red hand held flares and one hand held orange smoke signal.

2.7 Retro-reflective tapes of an approved type (each tape being not less than 300 millimetres long not less than 50 millimetres wide), fitted on top of the gunwale of the boat and on the outside of the boat 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 500 millimetres.

NOTE: The small items of equipment including water, flares and smoke signal may be kept in a buoyant container which may be stowed in a suitable position in the vessel at the discretion of the Fiji Marine Board.

## 3 Swamp Test:

3.1 Every approved boat, or type of boat shall undergo a swamp test which shall consist of completely swamping the boat in seawater with the full complement of adults and all equipment on board.

The boat shall maintain its stability in this condition with its gunwale above the water and all personnels mouths above water when sitting upright on the bottom of the boat.

## 4. Launching arrangements:

## 4.1 The boat shall either:

have davits of such construction as specified in Annex B, that the boat can be lowered safely into the water with its full complement of persons and equipment on board, or, be of such light construction and carried at a sufficiently low point in the vessel that it can be launched safely and upright by hand and the personnel board direct from the vessel, or, subject to the Fiji Marine Board approval, lowered astern of the vessel.

## APPENDIX B

DAVITS AND LAUNCHING ARRANGEMENTS  
FOR APPROVED BOATS

## 8 1. Type and Construction of davits:

1.1 Davits may be luffing type; or where placed at the stern of the vessel, may be fixed rigidly, with the boat situated outboard.

1.2 The davits must be so constructed and placed that the boat when equipped and manned with its complement of launching crew and equipment can be turned out and lowered to the embarkation level; and can be fully lowered to the water with its full complement of persons and equipment when the vessel has a list or trim of upto 25 degrees either way.

## 2. Stresses:

2.1 All parts of the davits and their equipment shall be capable of withstanding a static load test of not less than 2.5 the maximum load. For this purpose each person shall be deemed to have a weight of 74 kg.

## 3. Falls:

3.1 Falls may be constructed of wire cordage such that they will run freely through the blocks under the minimum weight of the boat.

3.2 The breaking strain of the falls shall be not less than 6 times the maximum load when lowering or hoisting.

3.3 Stowage for falls shall be provided, to keep them ready for use and protected from deterioration.

3.4 Bollards or cleats shall be provided for the falls where cordage is used.

3.5 Falls shall be long enough for the fully loaded boat to reach the water when the vessel has a list of 15 degrees either way or a trim of 10 degrees.

3.6 The lower block of the falls shall be so designed that the falls may be speedily disengaged or engaged with the lifting hook of the boat.

## 4. Hoisting facilities:

4.1 There shall be provided means for hoisting the boat in its falls with its full equipment and a minimum of 3 persons onboard. Where crew members are too few to hoist the boat by hand, there shall be a means of leading the falls to power or hand operated winches.

## 5. Embarkation level:

5.1 The outturn of the davits shall be such that the boat rests, or may be easily bowsed in to the ships hull to give safe access at embarkation level.

## APPENDIX C

## COASTAL LIFERAFTS (INFLATABLE)

## 1. Construction:

1.1 The liferaft shall be so constructed that, when fully inflated and floating with the cover uppermost, it shall be stable in a seaway.

1.2 The liferaft shall be so constructed that if it is tipped into the water from a height of 6 metres or from its stowed position, whichever is the greater, neither the liferaft nor its equipment will be damaged.

1.3 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.

1.4 The liferaft shall be fitted with a painter and shall have a line securely becketed around the outside, and a life-line fitted around the inside.

1.5 The liferaft shall be capable of being readily righted by one person if it inflates in an inverted position.

1.6 The liferaft shall be fitted at each opening with efficient means to enable persons in the water to climb on board.

1.7 The liferaft shall be contained in a valise or other container so constructed as to be capable of withstanding hardware under conditions met with at sea. The liferaft in such valise or container shall be inherently buoyant.

1.8 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.

1.9 The total weight of the liferaft and its equipment, contained in a valise or other container, shall not exceed 180 kg.

1.10 The floor of the liferaft shall be waterproof.

1.11 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.

1.12 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.

1.13 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.

1.14 The liferaft shall be capable of operating through temperature range of 66 degrees C. to -18 degrees C.

## 2. Capacity:

2.1 The carrying capacity of an inflatable coastal liferaft shall be the largest whole number obtained from:

$$(a) \quad \frac{V}{0.096} \quad \text{where } V = \text{volume of buoyancy tubes,} \\ \text{excluding thwarts or arches, in cubic meters} \\ \text{when liferaft inflated.}$$

OR

$$(b) \quad \frac{A}{0.372} \quad \text{where } A = \text{surface area of floor of} \\ \text{liferaft, including thwarts, if any,} \\ \text{in cubic meters when liferaft inflated.}$$

whichever is the less subject to the provisions of item 2.2 below.

2.2 The carrying capacity of an inflatable coastal liferaft shall be not less than 4 persons, nor more than 25 persons.

### 3. Equipment:

The equipment and rations to be provided in every inflatable coastal liferaft shall be as follows:

- 3.1 one sponge for each person included in the carrying capacity of the liferafts;
- 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 one spare set of batteries and one spare bulb in a waterproof container;
- 3.7 one sea-anchor, permanently attached to the liferafts;
- 3.8 one litre of fresh water for each person in carrying capacity of liferaft, to be contained in watertight and rustproof receptacles;
- 3.9 one safety tin-opener;
- 3.10 two red hand held flares and one hand held orange smoke signal complying with the requirements of Appendix M;
- 3.11 an approved first-aid kit;
- 3.12 one copy of the rescue signal table used by life-saving stations, marine rescue units and vessels and persons in distress;
- 3.13 500 grams of
  - (i) barley sugar;
  - or
  - (ii) other non-thirst provoking food, containing no protein or fat and providing at least 1500 kilojoules per 100 g weight for each person included in the carrying capacity of the liferaft (being barley sugar or other food that has been in the liferaft for a period not exceeding 2 years);
- 3.14 six sea-sickness tablets 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 a watertight container-being furnished with a waterproof 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;
- 3.19 retro-reflective tape of an approved type (and being not less than 50 millimetres in width) shall be fitted to the underside of the floor of a liferaft in such a way that the tape forms a cross at the centre of the floor. The length of the tapes shall be:
  - 3.19.1 for a circular liferaft-not less than half the diameter of the liferaft; and
  - 3.19.2 for other liferafts-not less than half the width length respectively, of the liferaft;

3.20 retro-reflective tape of an approved type (each tape being not less than 300 millimetres in length and not less than 50 millimetres in width) shall be spaced around the cover, or each of the covers, with which the liferaft in such a way that:

- 3.20.1 the distance between the centre of one tape and the centre of the tape next in line is not greater than 500 millimetres; and
- 3.20.2 the distance between the lower edge of the tape and the lower edge of the cover is not less than half the height of the cover; and
- 3.21 two retro-reflective tapes of an approved type (and being not less than 50 millimetres in width) shall be placed at the centre of the top of a liferaft cover in the form of a cross. The lengths of the tapes shall be:
  - 3.21.1 for a circular liferaft-not less than half the diameter of the liferaft; and
  - 3.21.2 for other liferafts-not less than half the width and length, respectively, of the liferaft.

## APPENDIX D

### BUOYANT APPLIANCES

Construction and capacity:

1. A buoyant appliance shall be manufactured from buoyant material having the properties detailed in item 1, Appendix F.
2. The encasing material shall be a material which:
  - 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.
  - 2.2 protects the buoyancy material from ultra violet light and physical damage;
  - 2.3 is fire retardant or it shall be painted with an approved fire retarding paint.
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 waterline but in no case shall be less than 6 metres.
4. A buoyant appliance shall be effective and stable and when floating either way up and shall not require adjustment before use.
5. Buoyant grab lines shall be fitted all round the appliance. The grab lines shall be secured to the appliance at not more than 460 mm centres nor less than 300 mm centres and interlaced to prevent movement. The depth of the loop when wet shall not be less than 150 mm and not more than 200 mm. The grab lines shall be of rope not less than 7 mm diameter. The fastenings securing the grab lines to the appliance shall be strong enough to permit the appliance being lifted by the grab lines.
6. The number of persons that the appliance shall be deemed fit to support shall be equal to:
  - 6.1 the greatest whole number obtained by the equation:
 
$$\text{No.} = \frac{70 (V - W)}{1000}$$
 Where No.=Number of persons  
 V=Volume in cubic metres  
 W=Weight of appliance in kgs
  - 6.2 the numl of grab line loops whichever number shall be less.
7. A buoyant appliance shall be coloured a highly visible colour.



8. A buoyant appliance shall not exceed 180 kg in weight unless suitable means are provided to enable it to be launched and, where the weight of the appliance exceeds 136 kg but does not exceed 180 kg in weight, suitable handles or rings shall be fitted to enable it to be launched by hand.

9. The buoyant appliance shall be fitted with retro-reflective tapes of an approved tape (each tape being not less than 300 millimetres long and not less than 50 millimetres wide) on the top and bottom of the buoyant appliance, spaced around the perimeter of the appliance so that the distance between the centre of a tape and the centre of the tape next in line is not greater than 500 millimetres.

## APPENDIX E

### INFLATABLE BUOYANT APPARATUS

#### 1. Construction

1.1 The Apparatus shall be so constructed that, when fully inflated it shall be stable in a seaway.

1.2 The Apparatus shall be so constructed that if it is dropped into the water from a height of 6 metres or from its stowed position, whichever is the greater, neither the Apparatus or its equipment will be damaged.

1.3 The Apparatus shall be fitted with a painter and shall have a buoyant grabline securely becketed round the outside at not more than 460 mm centres nor less than 300 mm centres and interlaced to prevent movement. The depth of the loops shall be not less than 150 mm and not more than 200 mm, and so placed that they will support a person in the water when the apparatus is either way up.

The fastenings shall be strong enough to permit the apparatus to be lifted by the grablines.

1.4 There shall be similar grabline fitted round the inside of the apparatus floatation chambers on each side of the floor.

1.5 The Apparatus shall be fitted with efficient means to enable persons in the water to climb on board.

1.6 The Apparatus shall be contained in a valise or other container so constructed as to be capable of withstanding hard wear under conditions met with at sea. The apparatus in such valise or container shall be inherently buoyant.

1.7 The buoyancy of the apparatus shall be divided into an even number of compartments, so arranged that either half of the total number of compartments is capable of supporting the number of persons in the carrying capacity of the apparatus.

1.8 The total weight of the apparatus, contained in a valise or other container, shall not exceed 180 kg.

1.9 The floor of the apparatus shall be waterproof.

1.10 The Apparatus shall be inflated by a gas which is not injurious to the occupants, and inflation shall take 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.

1.11 The Apparatus shall be of a suitable material and construction, and shall be so constructed as to be capable of withstanding exposure for 30 days afloat in all sea conditions. The material shall be of a highly visible colour

1.12 The Apparatus shall be suitable for its purpose when floating either way up and shall not require adjustment before use.

#### 2. Capacity:

2.1 The apparatus shall be designed to contain at least 25% of the total persons it is designed to support within the apparatus, and supported out of the water by its floor. It shall provide adequate floating for the remaining persons it is designed to support, externally in the water.

2.2 The carrying capacity of the apparatus shall be the largest whole number obtained from:

$$(a) \frac{(V)}{(0.035)} \quad \text{Where } V = \text{volume of buoyancy tubes in cubic metres when inflated}$$

OR

$$(b) \frac{(A + C)}{(0.372 \quad 0.3)} \quad \text{Where } A = \text{surface area of floor of apparatus in square metres when inflated}$$

$$C = \text{circumference of apparatus in metres when inflated}$$

Whichever is the less, subject to the provisions of item 2.3 below.

2.3 The carrying capacity of an inflatable buoyant apparatus shall not be less than 10 persons nor more than 55 persons.

#### 3. Equipment:

The equipment to be provided in every Inflatable Buoyant Apparatus shall be as follows:

3.1 one topping-up pump or bellows;

3.2 one sea-anchor permanently attached to the apparatus;

3.3 one buoyant rescue quoit with 30 m line;

3.4 one repair outfit;

3.5 one safety knife;

3.6 one instruction handbook.

## APPENDIX F

### INTERNAL BUOYANCY IN SMALL VESSELS

1. The material shall have the following properties:

1.1 Density—32 kg/cubic metres minimum.

1.2 Compressive Strength (at 10 per cent strain)—2.4 kg square cm minimum.

1.3 Closed Cell Content—92 per cent minimum.

1.4 Water Uptake—400 cc/square metres maximum.

1.5 Dimensional Stability—(original linear dimensions=100).

1.5.1 Temperature Cycling—15 degrees C to +70 degrees C.

1.5.2 14 days under 100 mm head of kerosene, toluene (conforming to ASTM/D841/1977), xylene (conforming to ASTM/D843/1977) or distillate (90 minimum).

1.6 Self-extinguishing to A.S.T.M. D-1692/68—Burning rate maximum 10 cm per minute.

1.7 High resistance to kerosene, petrol, distillate and oils.

2. The required quantity of material in cubic metres shall be calculated by:

$$2.1 \text{ Wooden Vessels} \quad \frac{1.2 \times F}{1000 - D}$$

$$2.2 \text{ Other Vessels} \quad \frac{1.2 (MK + F)}{1000 - D}$$

where

$M$  = dry mass of hull material in kgs  
 $K$  = density of hull material—density of fresh water  
 density of hull material      kg/cubic metres

$F$  = total dry mass of fittings and equipment including machinery installation, if fitted, in kgs  
 $D$  = density of buoyancy material in kg/cubic metres

Note: Unless otherwise determined by the Fiji Marine Board  $K$  may be taken as:

Aluminium	0.62
G.R.P.	0.375
Steel	0.87

3. The material shall not be sprayed in, in situ, but shall be manufactured in slab form under controlled conditions, cut to the required size and fitted into the vessel.

4. Before fitting into position, each slab of the material shall be coated on all surfaces with an approved fire retardant paint or fire retardant resin.

5. The material shall be fitted into the vessel so that:

5.1 the centre of mass of the material is above the flooded centre of gravity of the vessel;

5.2 it is protected from physical damage;

5.3 it is protected from direct sunlight;

5.4 it is at least 0.5 metres away from any dry exhaust line or other source of heat;

5.5 it is secured to the satisfaction of the Surveyor.

## APPENDIX G

LIFEBUOYS; SELF-IGNITING LIGHTS,  
SMOKE SIGNALS AND BUOYANT LINES

1. Lifebuoys:

1.1 General Specification.

1.1.1 A lifebuoy shall be of an approved type.

1.1.2 A lifebuoy shall be constructed of solid cork evenly formed and securely plugged, or of other equally efficient buoyant material not affected by oil or oil products.

1.1.3 Where a lifebuoy is made of plastic or other synthetic compounds, the lifebuoy shall be capable of retaining its buoyant properties and durability when exposed to all weathers on board ship and when in the water.

1.1.4 A lifebuoy shall be capable of floating in fresh water for not less than twenty-four hours with 14.5 kg of iron suspended from it.

1.1.5 The inside diameter of a lifebuoy shall be 450 mm and the outside diameter 750 mm with:

- (a) the major axis of the section being 150 mm; and
- (b) the minor axis of the section being 100 mm.

1.1.6 The buoyant material shall be covered with good quality material.

1.1.7 The lifebuoy shall be covered with a material of or painted a highly visible colour.

1.1.8 The grab lines shall be of good quality unkindable lines, well secured to the cover at four equidistant points, and shall provide four loops of line each not less than 700 mm long.

1.1.9 The weight of a lifebuoy shall not be less than 4.3 kg and shall not exceed 6.1 kg.

1.1.10 A lifebuoy shall not be fitted with rushes, cork shavings, granulated cork or other loose granulated material or depend for its buoyancy upon air compartments requiring inflation.

1.1.11 A lifebuoy shall be fitted with retro-reflective tapes of an approved type (each tape being not less than 50 millimetres wide) around or on both sides of, the lifebuoy at four equidistant points.

1.2 Material Other Than Cork:

For lifebuoys constructed of foam buoyancy materials, see the material requirements detailed in Appendix H.

1.3 For lifebuoys constructed of other buoyancy materials the manufacturer shall consult with the Authority regarding the applicable test requirements.

2. Lifebuoys self-igniting lights:

2.1 A self-igniting light attached to a lifebuoy:

2.1.1 shall be so constructed that it is not extinguishable by water;

2.1.2 shall be capable of burning for not less than forty-five minutes; and

2.1.3 shall have luminous intensity of not less than 2 candelas in all directions of the upper hemisphere.

3. Lifebuoys smoke signals:
- 3.1 A smoke signal attached to a lifebuoy shall comply with the requirements of Appendix M.
4. Lifebuoy buoyant lines:  
A life-line fitted to a lifebuoy shall be of a buoyant material, and shall be of at least 30 metres in length.

## APPENDIX H

### COASTAL LIFEJACKET

#### 1. Specifications for a Coastal Lifejacket:

##### 1.1 General conditions:

The Fiji Marine Board shall not approve any lifejacket type unless it has been successfully tested by a Maritime Safety Department of the Government of the country in which the lifejacket was manufactured, or a Standards Institute recognised by that Government.

1.2 A lifejacket shall not sustain burning or continue melting after being totally enveloped in a fire for a period of 2s.

1.3 A lifejacket shall be so constructed that:

1.3.1 a person can correctly do it within one minute without assistance; its ties and fastenings should be few and simple;

1.3.2 it is capable of being worn inside out or is clearly capable on being worn in only one way and cannot be donned incorrectly;

1.3.3 it is comfortable to wear and fit all sizes of persons;

1.3.4 it allows the wearer to jump from a height of at least 3 m into the water without injury and without dislodging or damaging the lifejackets;

1.3.5 it allows the wearer to swim a short distance and board a liferaft.

1.4 A lifejacket shall have sufficient buoyancy and stability in calm fresh water to:

1.4.1 lift the mouth of an exhausted or unconscious person not less than 100 mm with the body inclined backwards at an angle of between 20 degrees and 50 degrees from the vertical;

1.4.2 turn the body of an unconscious person in the water from any position to one where the mouth is clear of the water within 5s.

1.5 A lifejacket should be of a conspicuous orange colour and be fitted with retro-reflective tape on the exposed part of the jacket.

1.6 A lifejacket shall be marked with the following:

"COASTAL LIFEJACKET"

The licence or Specification number;

The intended body mass range 32 kg or more, or less than 32 kg;

Any cautionary note concerning deterioration of the buoyancy or other material, the words "FRONT" and "BACK" where there may be any doubt;

Clear instructions for donning.

1.7 The lifejacket shall be fitted with retro-reflective tapes placed as high up on the lifejacket as possible in not less than six places on the side and six places on the outside of the lifejacket, each tape being not less than 100 mm long and not less than 50 mm wide, so that not less than six tapes are always visible whichever way the lifejacket is worn.

1.8 Where the buoyancy material is kapok:

1.8.1 it shall contain not less than 567 grams of kapok;

1.8.2 the kapok shall be of good flotation quality, well teased, and clean;

1.8.3 the kapok shall be protected from the effects of oil or oily products so that the loss of buoyancy in the lifejackets, after floating in disturbed water containing a layer of not less than 3 millimetres in depth of a mixture of gas oil for a period of 48 hours, shall not exceed 2 per cent of the initial buoyancy. For the purpose of this test the lifejacket shall be loaded with weights equal to half its initial buoyancy; and

1.8.4 the kapok shall be contained in PVC envelopes in cases where the outer covering is not impervious to oil; these shall contain as little air as possible and comply with the following:

(i) welding is to be the high frequency method. Each seam to be not less than 1.5 mm wide and, where welding is not continuous, the joins shall be crosswelded or lapped;

(ii) PVC film to be soft of gravimetric thickness not less than 0.3 mm.

1.9 Where the buoyancy is a material other than kapok:

1.9.1 the buoyancy material shall have a S.G. of not more than 0.192, and shall be of good quality and clean. If the material is in pieces, the size of each piece shall be not less than 164 cubic cm, unless such pieces are in layer form and are fastened together with an approved adhesive;

1.9.2 the buoyancy material shall be chemically stable and of low flammability and be free from shrinkage.

## APPENDIX I

### SHELTERED WATERS LIFEJACKETS

#### 1. Specifications for a Sheltered Waters Lifejacket:

##### 1.1 General Conditions:

The Fiji Marine Board shall not approve any lifejacket type unless it has been successfully tested by a Marine Safety Department of the Government of the country which the lifejacket was manufactured, or a Standards Institute recognised by that Government.

1.2 A lifejacket shall not sustain burning or continue melting after being totally enveloped in a fire for a period of 2s.

1.3 A lifejacket shall be so constructed that:

1.3.1 a person can correctly do it within one minute without assistance; its ties and fastenings should be few and simple;

1.3.2 it is capable of being worn inside out or is clearly capable of being worn in only one way and cannot be donned incorrectly;

1.3.3 comfortable to wear and fit all sizes of persons;

1.3.4 it allows the wearer to jump from a height of at least 3 m into the water without injury and without dislodging or damaging the lifejacket.

1.4 A lifejacket shall have sufficient buoyancy and stability in calm fresh water to:

1.4.1 lift the mouth of an exhausted or unconscious person not less than 100 mm with the body inclined backwards at an angle of between 20 degrees and 50 degrees from the vertical;

1.4.2 turn the body of an unconscious person in the water from any position to one where the mouth is clear of the water within 8s.

1.5 A lifejacket should be of a conspicuous orange colour and be fitted with retro-reflective tape on the exposed of the jacket.

1.6 A lifejacket shall be marked with the following:

"SHELTERED WATERS ONLY";

The licence or Specification number;

The intended body mass range 32 kg or more, or less than 32 kg;

Any cautionary note concerning deterioration of the buoyancy or other material, the words "FRONT" and "BACK" where there may be any doubt.

## APPENDIX J

### IN-FIELD CHECK FOR BUOYANCY OF LIFEJACKETS

CHECK A. The procedure shall be as follows:

- Fill with fresh water a tank large enough to hold the wire basket required in (b).
- From an accurate set of scales suspend a wire basket with lead or iron ballast not less than 8 kg securely attached.
- Immerse the basket in the tank described in (a) and read the weight "A".
- Remove the basket and weight and secure the lifejacket inside the basket.
- Lower the basket into the tank again until submerged at least 50 mm and read the weight "B".
- Deduct the weight "B" from the weight "A". The difference is the buoyancy which should be equal to or greater than the minimum buoyancy rating of the lifejacket.
- The lifejacket should be left submerged for a further 24 hours and the buoyancy tested again. The loss in buoyancy over 24 hours should not exceed 5%.

Note: Care should be taken to squeeze out all trapped air as this will affect the buoyancy reading.

CHECK B. The procedure shall be as follows:

- Take the following apparatus:
  - An open topped drum or tank, about the size of a "44 gallon drum" filled with fresh water.
  - A large open mesh basket preferably of the type of plastic clothes basket which will barely float in fresh water (that is, it has a neutral buoyancy). A wire basket would also be suitable but immersed weight must be taken into account when calculating immersed weight of the ballast.

(3) Ballast of lead, cast iron or steel with a weight in air as specified in Table B1 for the particular aid.

(b) Attach the ballast securely to the open rim of the basket, place the lifejacket inside the basket and drop the basket bottom-up into the test tank.

Note: Care must be taken to ensure that any trapped air is squeezed out when the basket is immersed.

(c) If the basket remains floating for at least 24 hours then the lifejacket has retained the buoyancy stated; if the basket sinks then the buoyancy of the lifejacket is not as stated.

Note: This test is intended as a field check only and may not necessarily provide and accurate indication of the buoyancy provided by the lifejacket.

CHECK "A" is a preferred test procedure and should be used where possible.

TABLE B1

BALLAST WEIGHT FOR THE IN-FIELD CHECKED OF BUOYANCY

Type of Lifejacket	Size	Minimum Buoyancy	Ballast	
			Lead	Cast iron or steel
SOLAS Life-jacket	Body mass:—			
	32 kg or more	156 N	17.5 kg	18.3 kg
	Less than 32 kg	67 N	7.5 kg	7.8 kg
Coastal Lifejacket	Adult	100 N	11.2 kg	11.7 kg
	Lifejacket for use in Sheltered Waters	71 N	7.9 kg	8.3 kg
	Child, medium	49 N	5.4 kg	5.7 kg
	Child, small	40 N	4.4 kg	4.7 kg

## APPENDIX K

### PORTABLE RADIO EQUIPMENT FOR LIFERAFT

Portable radio equipment for liferaft shall be designed, constructed and equipped to comply with the requirements of the SAFETY CONVENTION.

## APPENDIX L

### LINE THROWING APPLIANCES

Line throwing Appliances shall be designed, constructed and equipped to comply with the requirements of the SAFETY CONVENTION.

## APPENDIX M

## PYROTECHNIC: DISTRESS SIGNALS

Pyrotechnic Distress Signals shall be designed, constructed and equipped to comply with the requirements of the SAFETY CONVENTION.

## APPENDIX N

## RESCUE SIGNAL TABLE

The following signals shall be used by life-saving stations and maritime rescue units when communicating with vessels or persons in distress and by vessels or persons in distress when communicating with life-saving stations and maritime rescue units. The signals used by aircraft engaged in search and rescue operations to direct vessels are indicated in paragraph (d) below. An illustrated table describing the signals listed below shall be readily available to the deck watchkeeper of every vessel to which this Section applies.

(a) Replies from life-saving stations or maritime rescue units to distress signals made by a vessel or person:

By day—Orange smoke signal or combined light and sound signal (thunderlight) consisting of three signals which are fired at intervals of approximately one minute.	You are seen— assistance will be given as soon as possible.
By night—White star rocket consisting of three single signals which are fired at intervals of approximately one minute.	(Reception of such signals shall have the same meaning).

If necessary the day signals may be given at night or the night signals by day.

(b) Leading signals for the guidance of small vessels with crews or persons in distress:

<i>Signal</i>	<i>Signification</i>
By day—Vertical motion of a white flag or the arms of firing of a green star-signal or signalling the code letter 'K' (—) given by light or sound-signal apparatus.	
By night—Vertical motion of a white light or flare, or firing of a green star-signal or signalling the code letter 'K' (—) given by light or sound-signal apparatus. A range (indication of direction) may be given by placing a steady white light or flare at a lower level and in line with the observer.	'This is the best place to land'.
By day—Horizontal motion of a white flag or arms extended horizontally or firing of a red star-signal or signalling the code letter 'S' (...) given by light or sound-signal apparatus.	

## PART I—PRELIMINARY

2. This Section should be read in conjunction with the Introduction, Definitions and General Requirements Section.

3. Fire appliances shall be maintained in good order, kept fully charged and available for immediate use at all times. All moveable fire appliances, other than firemen's outfits, carried in compliance with this Section shall be stowed where they are readily accessible for a space in which they are intended to be used. The portable fire extinguisher intended for use in a space shall be suitable for dealing with the possible fire hazard and may be stowed near the entrance to and outside of the space.

4. Where any non-passenger vessel to which this Section applies carries prescribed explosives in a compartment, that compartment and the adjoining cargo compartments shall be provided with a fire detection system complying with the requirements of Appendix A of this Section or a smoke detection system. Steam shall not be used for fire smothering purposes in any compartment containing explosives.

5. For the purpose of this Section:

5.1 prescribed explosive means more than nine kilograms of explosives, more than one tonne of distress signals for use in vessels or aircraft, or fireworks that are likely to explode violently; and

5.2 compartment means all spaces contained between two adjacent permanent bulkheads and includes the lower hold and all cargo spaces above it. The whole of any shelter deck space not subdivided by steel bulkheads the openings in which can be closed by steel closing plates shall for the purpose of this clause be considered as a single space. Where steel bulkheads with openings closed by steel closing plates are fitted, the enclosed spaces in the shelter deck shall be considered as part of the compartment or compartments below.

6. This clause shall apply to all vessels. There shall be provided means for stopping ventilating fans serving machinery, accommodation, service and cargo spaces. For machinery and cargo spaces there shall be provided means for closing all skylights, doorways, ventilators, annular spaces around funnels and other openings to such spaces. Such means shall be capable of being operated from positions outside the said spaces which would not be made inaccessible by a fire within such spaces.

7. Machinery driving forced and induced draught fans, oil fuel, lubricating oil and hydraulic oil pumps and separators shall be fitted with remote controls situated outside the spaces in which such machinery or pumps are situated. Such controls shall be capable of stopping such machinery or pumps in the event of fire in the said spaces.

8. This clause shall apply to all vessels. Every pipe connected to any oil fuel storage, settling, or daily service tank, not being a double bottom tank, which if damaged would permit discharge of the contents so as to cause a fire hazard shall be fitted with a valve or cock which shall be secured to the tank to which it is connected. The valve or cock shall be capable of being closed from a readily accessible position outside the space in which the tank is situated, provided that in the case of any inlet pipe to such a tank a non-return valve similarly secured to the tank may be substituted. In the case of an oil fuel deep that traversed by any shaft or pipe tunnel, a valve shall be fitted on the tank but an additional valve or valves may be fitted on the pipe line or lines outside the tunnel or tunnels to enable control to be exercised in the event of fire.

By night—Horizontal motion of a white light or flare or firing of a red-star signal or signalling the code letter 'S' (...) given by light or sound-signal apparatus.

By day—Horizontal motion of a white flag, followed by the placing of the white flag in the ground and the carrying of another white flag in the direction to be indicated or firing of a red-star signal vertically and a white star-signal in the direction towards the better landing place or signalling the code 'S' (...) followed by the code letter 'R' (—) if a better landing place for the vessel in distress is located more to the right in the direction of approach or the code letter 'L' (—) if a better landing place for the vessel in distress is located more to the left in the direction of approach.

By night—Horizontal motion of a white light or flare, followed by the placing of the white light or flare on the ground and the carrying of another white light or flare in direction to be indicated or firing of a red star-signal vertically and a white star-signal in the direction towards the better landing place or signalling the code letter 'S' (...) followed by the code 'R' (—) if a better landing place for the vessel in distress is located more to the right in the direction of approach or the code letter 'L' (—) if a better landing place for the vessel in distress is located more to the left in the direction of approach.

(c) Signals to be employed in connexion with the use of shore life-saving apparatus:

#### Signal

By day—Vertically motion of a white flag or the arms or firing of a green star-signal.

By night—Vertically motion of a white light or flare or firing of a green star-signal.

By day—Horizontal motion of a white flag or arms extended horizontally or firing of a red star-signal.

'Landing here highly dangerous'

'Landing here highly dangerous. A more favourable location for landing is in the direction indicated.'

#### Signification

In general:  
'Affirmative.'  
Specifically:  
'Rocket line is held.'

'Tail block is made fast.'  
'Hawser is made fast.'  
'Man is in the breeches buoy.'  
'Haul away.'

In general:  
'Negative.'  
Specifically:  
'Slack away.'  
'Avast hauling.'

## PART 2—SCALES OF FIRE FIGHTING EQUIPMENT

(Note: The following scales apply to vessels other than Safety Convention Vessels (Class 1 and 2A))

### VESSELS OF CLASS 2B

Size	Requirements
<b>Main Fire Pumps</b>	
25 metres and over	One fire pump, complying with Appendix B, capable of delivering of jet of water from any fire hydrant.
10 metres and over but less than 25 metres	One power driven fire pump capable of delivering one jet of water from any hydrant, hose or nozzle with which the vessel is supplied in compliance with this Section whilst maintaining pressure of 150 kilopascals.
<b>Emergency Fire Pumps</b>	
Emergency fire pumps shall	comply with Appendix C.
If the main fire pump and its source of power and sea connection are not situated outside the compartments containing oil fired boilers or internal combustion type propelling machinery a manually operated emergency fire pump in a position outside that compartment.	
<b>Firemain, Water Service Pipes, Hydrants (other than hydrants to boiler and machinery spaces) and Jets of Water</b>	
25 metres and over	Shall comply with Appendix D and provide two jets of water in accordance with sub-item 1.3 of that Appendix.
Less than 25 metres but over 10 metres	Shall comply with Appendix D and provide one jet of water in accordance with sub-item 1.4 of that Appendix.
<b>Hydrants in Boiler and Machinery Spaces</b>	
All vessels	One hydrant together with hose and fittings in each space containing oil-fired boiler or internal combustion type propelling machinery.
<b>Hoses</b>	
Fire hoses together with their fittings shall comply with Appendix D and be provided as follows:	
25 metres and over	Two, the total length of which shall be at least 50 per cent of the length of the vessel. A spare hose shall be provided in addition to such hoses.
10 metres and over but less than 25 metres	One hose.
The hoses required above shall be in addition to any hoses required in the machinery space.	

- (d) Signals used by aircraft engaged on search and rescue operations to direct vessels towards an aircraft, vessel or person in distress:
- (i) The following procedures performed in sequence by an aircraft mean that the aircraft is directing a vessel towards an aircraft or a vessel in distress:
- (1) circling the vessel at least once;
  - (2) crossing the projected course of the vessel close ahead at a low altitude, opening and closing the throttle or changing the propeller pitch;
  - (3) heading in the direction in which the vessel is to be directed.
- Repetition of such procedure has the same meaning.
- (ii) The following procedure performed by an aircraft means that the assistance of the vessel to which the signal is directed is no longer required:
- crossing the wake of the vessel close astern at a low altitude, opening and closing the throttle or changing the propeller pitch.

## SECTION 11

## FIRE APPLIANCES

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## VESSELS OF CLASS 2B (cont'd)

Size	Requirements
25 metres and over certified to carry not less than 40 berthed passengers	<p><b>Fixed Fire Extinguishing Installation in Accommodation and Service Spaces</b></p> <p>The enclosed accommodation and service spaces shall be provided with a fixed fire extinguishing installation in accordance with Regulation 12 of the Safety Convention. The Marine Board may exempt a vessel from this requirement where additional fire extinguishers are provided which in the opinion of the Marine Board provide an equivalent standard of protection.</p>
25 metres and over	<p><b>Fixed Fire Extinguishing Installation—Machinery Space</b></p> <p>There shall be provided for the protection of any space containing:</p> <ol style="list-style-type: none"> <li>(a) any oil-fired boiler, oil fuel settling tank or oil fuel unit; or</li> <li>(b) internal combustion type machinery used for main propulsion, or having in the aggregate a total brake power of not less than 750 kW for auxiliary purposes;</li> </ol> <p>one of the fixed fire extinguishing installations detailed in Appendix E.</p>
10 metres and over but less than 25 metres	<p>A vessel fitted with oil fired boilers or internal combustion type machinery used for main propulsion and decked in the way of the machinery space shall be provided with a fixed fire extinguishing installation complying with Appendix F. There may be substituted for this installation a water spraying system supplied from a hand pump situated outside the machinery space which may be a hand pump otherwise required. The pump shall be connected by a fixed piping to a sufficient number of water spraying nozzles suitably sited in the machinery space and capable of extinguishing oil fires. When such a system is installed means shall also be provided for detecting the products of combustion prior to or resulting from an outbreak of fire in the machinery space.</p>

## VESSELS OF CLASS 2B (cont'd)

Size	Requirements
	<b>Portable Fire Extinguishers</b>
	Portable fire extinguishers shall comply with Appendix G and be provided as follows:
25 metres and over	<p>(a) a sufficient number to ensure that one will be readily available for use in any part of the accommodation or service spaces, but not less than two.</p> <p>(b) Two, suitable for extinguishing oil fires, in each firing space and each space containing any part of an oil fuel installation.</p> <p>(c) One in each control space.</p> <p>(d) In each unmanned machinery space which contains internal combustion type machinery used for main propulsion, or having in the aggregate a total brake power not less than 750 kW for auxiliary purposes, one for each 750 kW brake power or part thereof. Two but not more than six shall be provided in any such space. The extinguishers shall be suitable for extinguishing oil fires.</p> <p>(e) In each space which is continually manned at sea and which contains internal combustion type machinery used for main propulsion, or having in the aggregate a total brake power not less than 750 kW for auxiliary purposes, and which is not provided with:</p> <p>(i) a foam fire extinguisher of 45 litres capacity or a carbon dioxide fire extinguisher of 15 kilograms capacity together with two portable fire extinguishers; or</p> <p>(ii) a fixed fire extinguishing installation complying with Appendix E together with two portable fire extinguishers—</p> <p>one for each 75 kW brake power or part thereof but not less than two nor more than seven.</p> <p>One readily available for use in the accommodation and service space.</p>
10 metres and over but less than 25 metres	
Less than 25 metres	Two, suitable for extinguishing oil fires, for use in each space containing propelling machinery.
Switchboards	One, suitable for extinguishing electrical fires at each main switchboard where the voltage carried on the board exceeds 50 volts.

## VESSELS OF CLASS 2B (cont'd)

Size	Requirements
	<b>Sand</b>
	Each boiler firing space shall be provided with the following:
25 metres and over	<p>(a) 0.15 cubic metres of sand or other dry material suitable for quenching oil fires. A scoop shall be provided for distribution; or</p> <p>(b) An additional portable fire extinguisher suitable for extinguishing oil fires.</p>
	<b>Asbestos Blankets</b>
25 metres and over	One in a galley where the overall deck area is less than 15 square metres and two in larger galleys.
	<b>Fire Buckets</b>
Less than 25 metres	2 with lanyards.
	<b>Fireman's Axe</b>
25 metres and over	One.
	<b>VESSELS OF CLASS 3</b>

Size	Requirements
	<b>Patrol Alarm and Communication System</b>
Where certified to carry not less than 40 passengers	<p>An efficient patrol system shall be maintained so that any outbreak of fire may be promptly detected. Manual fire alarms which will enable the fire patrol to give an alarm immediately to the navigation bridge or fire control station shall be fitted throughout the accommodation and service spaces.</p> <p>A special alarm, operated from the navigation bridge or fire control station, shall be fitted to summon the crew. This alarm may be part of the vessel's general alarm system but it shall be capable of being sounded independently of the alarm to the passenger spaces.</p> <p>A public address system or other effective means of communication shall be available throughout the accommodation and services spaces and control stations.</p>
	<b>Main Fire Pumps</b>
1000 tons and over	Two fire pumps, complying with Appendix B, each capable of delivering simultaneously one jet of water from each of any two fire hydrants.
500 tons and over but less than 1000 tons.	Two fire pumps, complying with Appendix B, each capable of delivering of jet water from any fire hydrant.



## VESSELS OF CLASS 3 (cont'd)

Size	Requirements
Less than 500 tons but 25 metres and over. 10 metres and over but less than 25 metres	One fire pump, complying with Appendix B, capable of delivering of jet of water from any fire hydrant. One power driving fire pump capable of delivering one jet of water from any hydrant, hose or nozzle with which the vessel is supplied in compliance with this Section whilst maintaining a pressure of 150 kilopascals.
<b>Emergency Fire Pumps</b>	
Emergency fire pumps shall comply with Appendix C and be provided as follows:	
500 tons and over	If a fire in any one compartment could put all the fire pumps out of action a fixed independently driven power operated emergency fire pump, in a position outside that compartment and provided that in any vessel of less than 1000 tons and emergency fire pump may be a portable power driven fire pump.
Less than 500 tons but 25 metres and over	If the main fire pump and its source of power and sea connection are not situated outside the compartment containing oil-fired boilers or internal combustion type propelling machinery a manually operated emergency fire pump in a position outside that compartment.
<b>Fireman, Water Service Pipes, Hydrants (other than hydrants and boiler and machinery spaces) and Jets of Water.</b>	
1000 tons and over	Shall comply with Appendix D and provide two jets of water in accordance with sub-item 1.3 of that Appendix.
Less than 1000 tons but 10 metres and over	Shall comply with Appendix D and provide one jet of water in accordance with sub-item 1.4 of that Appendix.
<b>Hydrants in Boiler and Machinery Spaces</b>	
500 tons and over	Two hydrants together with hoses and fittings in each space containing oil-fired boiler or internal combustion type propelling machinery—one on the port side and one on the starboard side. Where there is access to the space by shaft tunnel one hydrant shall be provided in the end of the tunnel adjacent to that space and supply to the hydrant shall be from a source outside of the space and the supply line shall not pass through that space.

## VESSELS OF CLASS 3 (cont'd)

Size	Requirements
<b>Hoses</b>	
1000 tons and over	Fire hoses together with their fittings shall comply with Appendix D and be provided as follows: One for each 30 metres length of vessel, but in any case not less than five. The total length of the hoses shall be at least 60 per cent of the length of the vessel. A spare hose shall be provided in addition to such hoses.
Less than 1000 tons but 25 metres and over	Two, the total length of which shall be at least 50 per cent of the length of the vessel. A spare hose shall be provided in addition to such hoses.
10 metres and over but less than 25 metres	One hose.
The hoses required above shall be in addition to any hoses required in the machinery spaces.	
2000 tons and over	<b>Fixed Fire Extinguishing Installation—Cargo Space</b> There shall be provided a fixed fire smothering installation complying with Appendix E which shall be so arranged as to protect every cargo space. Provided that in any tanker, a fixed installation discharging foam externally and through suitable mobile sprayers internally to the liquid cargo tanks complies with Appendix E it may be substituted for the fixed fire smothering gas installation required by the above. The Marine Board may exempt any vessel from the requirements to provide a fixed fire smothering installation in the cargo holds of a vessel, not being the tanks of a tanker, if it is satisfied that— The holds are provided with steel hatch covers and effective means of closing all ventilators and other openings to the holds, or coal, grain or such other cargo as the Marine Board may consider to be of equivalent low hazard, or To require compliance would be unreasonable on account of the short duration of the voyages on which the vessel is engaged.
<b>Fixed Fire Extinguishing Installation—Machinery Space</b>	
25 metres and over	There shall be provided for the protection of any space containing: (a) any oil-fired boiler, oil fuel settling tank or oil fuel unit; or

## VESSELS OF CLASS 3 (cont'd)

Size	Requirements
10 metres and over but less than 25 metres	<p>(b) internal combustion type machinery used for main propulsion, or having in the aggregate a total brake power of not less than 750 kW for auxiliary purposes;</p> <p>one of the fixed fire extinguishing installations detailed in Appendix E.</p> <p>A vessel fitted with oil-fired boilers or internal combustion type machinery used for main propulsion and decked in the way of the machinery space shall comply with a fixed fire extinguishing installation complying with Appendix F. There may be substituted for this installation a water spraying system supplied from a hand pump otherwise required. The pump shall be connected by fixed piping to a sufficient number of water spraying nozzles suitably sited in the machinery space and capable of extinguishing oil fires. When such a system is installed means shall also be provided for detecting the products of combustion prior to or resulting from an outbreak of fire in the machinery space.</p> <p>The Marine Board may exempt a vessel of less than 25 metres length from this requirement where alternative equivalent means of fire extinction, such as additional fire extinguishers are provided, to the satisfaction of the Marine Board.</p> <p><b>Non-Portable Foam and CO<sub>2</sub> Extinguishers</b></p>
500 tons and over	<p>(a) In each boiler room one foam fire extinguisher of 45 litres capacity or a carbon dioxide fire extinguisher of 15 kilograms capacity if the number of burners therein is five or more. If the number of burners in the boiler room is less than five there shall be provided for each burner therein one portable fire extinguisher suitable for extinguishing oil fires.</p> <p>(b) In any space containing internal combustion type machinery used for main propulsion or having in the aggregate a total brake power of not less than 750 kW for auxiliary purposes there shall be provided a foam fire extinguisher of 45 litres capacity of a CO<sub>2</sub> fire extinguisher of 15 kilograms capacity.</p> <p>(c) There shall be provided in each space containing steam turbines or enclosed pressure lubricated steam engines used either for main propulsion, or having in the aggregate a total brake power of not less than 750 kilowatts for auxiliary purposes, foam fire extinguishers of 45 litres capacity or car-</p>

## VESSELS OF CLASS 3 (cont'd)

Size	Requirements
500 tons and over	<p>bon dioxide fire extinguishers of 15 kilograms capacity. The extinguishers shall be of such number and so positions as to enable foam or carbon dioxide to be directed on to any part of the pressure lubrication system and on to any part of the casings enclosing pressure lubricated parts of the turbines, engines or associated gearing if any. Provided that such extinguishers shall not be required if equivalent protection is provided in such spaces by a fixed fire extinguishing installation fitted in compliance with Appendix E.</p> <p><b>Portable Fire Extinguishers</b></p> <p>Portable fire extinguishers shall comply with Appendix G and be provided as follows:</p> <p>(a) A sufficient number to ensure that one will be readily available for use in any part of the accommodation or service spaces. The number of extinguishers shall not be less than five on vessels of 1000 tons and over, and not less than three on vessels of 500 tons and over but less than 1000 tons.</p> <p>(b) One in a galley where the overall deck area is less than 15 square metres and two in larger galleys.</p> <p>(c) One in each control station.</p> <p>(d) In each space containing internal combustion type machinery used for main propulsion, or having in the aggregate a total brake power of not less than 750 kW for auxiliary purposes, one for each 750 kW brake power or part thereof. Two but not more than six shall be provided in any such space. The extinguishers shall be suitable for extinguishing oil fires.</p> <p>(e) In each space containing steam turbines or enclosed pressure lubricated steam engines used for main propulsion, or having in the aggregate a total brake power of not less than 750 kW brake power or part thereof. Two but not more than six shall be provided in any such space. The extinguishers shall be additional to any provided in compliance with (d) above. The extinguishers with (d) above.</p> <p>(f) Two, suitable for extinguishing oil fires, in each firing space and each space containing any part of any oil fuel installation. These shall be in addition to any furnished in lieu of a non-portable foam or CO<sub>2</sub> extinguisher.</p>

## VESSELS OF CLASS 3 (cont'd)

Size	Requirements
25 metres and over but less than 500 tons	<p>(a) A sufficient number to ensure that one will be readily available for use in any part of the accommodation or service spaces, but not less than two.</p> <p>(b) Two, suitable for extinguishing oil fires, in each firing space and each space containing any part of an oil fuel installation.</p> <p>(c) One in each control station.</p> <p>(d) In each unmanned machinery space which contains internal combustion type machinery used for main propulsion, or having in the aggregate a total brake power not less than 750 kW for auxiliary purposes, one for each 750 kW brake power or part thereof. Two but not more than six shall be provided in any space. The extinguishers shall be suitable for extinguishing oil fires.</p> <p>(e) In each space which is continually manned at sea and which contains internal combustion type machinery used for main propulsion, or having in the aggregate a total brake power not less than 750 kW for auxiliary purposes, and which is not provided with:</p> <p>(i) a foam fire extinguisher of 45 litres capacity or a carbon dioxide fire extinguisher of 15 kilograms capacity together with two portable fire extinguishers; or</p> <p>(ii) a fixed fire extinguishing installation complying with Appendix E together with two portable fire extinguishers— one for each 75 kW brake power or part thereof but not less than two or more than seven.</p>
10 metres and over but less than 25 metres	One readily available for use in the accommodation and service space.
Less than 25 metres	Two, suitable for extinguishing oil fires for use in each space containing propelling machinery.
	<p>Switchboards</p> <p>One portable extinguisher suitable for extinguishing electrical fires, at each main switchboard where the voltage carried on the board exceeds 50 volts.</p>

## Sand

Each boiler firing space shall be provided with the following:

1000 tons and over

- (a) 0.25 cubic metres of sand or other dry material suitable for quenching oil fires. A scoop shall be provided for distribution; or

## VESSELS OF CLASS 3 (cont'd)

Size	Requirements
25 metres and over but less than 1000 tons	<p>(b) An additional portable fire extinguisher suitable for extinguishing oil fires.</p> <p>(a) 0.15 cubic metres of sand or other dry material suitable for quenching oil fires. A scoop shall be provided for distribution; or</p> <p>(b) An additional portable fire extinguisher suitable for extinguishing oil fires.</p>
25 metres and over	<p>Asbestos Blankets</p> <p>One in galley where the overall deck area is less than 15 square metres and two in larger galleys.</p> <p>Fireman's Outfits</p> <p>Firemen's outfits shall comply with Appendix H and be provided as follows:</p>
4000 tons and over	3 outfits
2500 tons and over but less than 4000 tons	2 outfits
500 tons and over but less than 2500 tons	1 outfit
	At least one outfit to include a breathing apparatus of the air hose type. If, in any vessel which carries firemen's outfits containing only breathing apparatus of the air hose type, an air hose exceeding 35 metres in length would be necessary to reach from the open deck well clear of any hatch or doorway to any part of the accommodation, service, cargo or machinery space, at least one breathing apparatus of the self-contained type shall be provided in addition.
	International Shore Connection
1000 tons and over	One complying with Appendix J.
	Fire Buckets
Less than 25 metres	2 with lanyards.
	Fireman's Axe
Less than 500 tons but 25 metres and over	One.

## PART 3—TYPES OF FIRE FIGHTING EQUIPMENT

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## APPENDIX A

## FIRE DETECTION SYSTEM

1. Every fire detection system fitted in compliance with this Section shall be capable of automatically indicating the presence of smoke or fire and its location. The indicators shall be centralised either on the navigating bridge or at other control stations which are provided with direct communication with the navigating bridge provided that the Marine Board may in any vessel permit the indicators to be distributed among several stations if they are satisfied that such arrangements are at least as effective as if the indicators were so centralised.
2. In any passenger vessel, electrical equipment used in the operation of any fire detection system fitted in compliance with this Section shall be capable of being supplied from two sources of electric power, one of which shall be an emergency source of power.
3. The indicating systems of any fire detection system fitted in compliance with this Section shall operate both audible and visible alarms at the stations referred to in item 1.
4. Exemptions: The Marine Board may exempt any vessel from the requirements of this Appendix if they are satisfied that to require compliance therewith would be unreasonable on account of the short duration of the voyage on which the vessel is engaged.

## APPENDIX B

## POWER OPERATED FIRE PUMPS

1. Each pump required under this Section shall be capable of delivering at least one jet simultaneously from each of any two hydrants, or one jet from any hydrant, whichever the case may be, through the hoses and nozzles provided in the vessel and shall comply with the requirements of items 2 and 3 of this Appendix.

2. In a passenger vessel to which this Section applies which is required by this Section to be provided with fire pumps operated by power, such fire pumps (other than any emergency fire pump) shall together be capable of delivering for fire fighting purposes a quantity of water, under the conditions and at the pressure specified in Appendix D of this Section of not less than two thirds of the quantity required to be dealt with by the bilge pumps.

3. In a vessel, other than a passenger vessel, to which this Section applies which is required by this Section to be provided with fire pumps operated by power, such fire pumps (other than any emergency fire pump) shall together be capable of delivering for fire fighting purposes a quantity of water under the conditions and at the pressure specified in Appendix D which shall not be less than the quantity obtained from the following formula:

$$\text{Quantity of water in tonnes per hour} = Cd^2$$

Where:

(a)  $C = 7.66 \times 10^{-3}$  for vessels required to be provided with more than one fire pump (excluding any emergency fire pump) and  $C = 3.83 \times 10^{-3}$  for vessels required to be provided with only one fire pump, and

(b)  $d = 25 + 1.68 L(B+D)$  to the nearest millimetre

where:

L=length of the vessel in metres

B=greatest moulded breadth of the vessel in metres

D=moulded depth of vessel to bulkhead deck in metres.

Provided that in no cargo vessel need the total required capacity of the fire pumps exceed 180 cubic metres per hour.

## 16. Section 11

4. Every fire pump required by this Section to be operated by power shall, except as expressly provided otherwise, be operated by a means other than the vessel's main engines. Fire pumps complying with this Appendix may be sanitary, ballast, bilge or general service pumps provided that they are not normally used for pumping oil and that if they are subject to occasional duty for the transfer or pumping of oil, suitable change-over arrangements are fitted and operating instructions are conspicuously displayed at the changeover position.

4.1 In a vessel to which this Section applies which is required to be provided with more than one fire pump operated by power (other than any emergency pump), every such fire pump shall have a capacity of not less than 80 per cent of the total capacity of the fire pumps required by items 2 and 3 divided by the number of fire pumps required by this Section provided that when more fire pumps operated by power than are required by this Section are provided in any vessel, the Marine Board may permit the capacity of any such additional fire pumps to be less than 80 per cent.

4.2 Every fire pump required by this Section which is operated by power shall be capable of producing from any fire hydrant or hydrants in the vessel at least the minimum number of jets of water as appropriate to the size and class of vessel, while maintaining the pressure required by Appendix D.

5. Relief valves shall be provided in conjunction with all fire pumps if the pumps are capable of developing a pressure exceeding the design pressure of the fire main, water service pipes, hydrants and hoses. Such valves shall be so placed and adjusted as to prevent excessive pressure in any part of the firemain system.

6. Every centrifugal pump which is connected to the firemain shall be fitted with a non-return valve.

## APPENDIX C

### 1. Emergency Fire Pumps

#### 1.1 The emergency fire pump shall be:

1.1.1 a fixed independently driven power operated pump. The sea suction valve, suction pipeline, and delivery pipeline shall not be located in or pass through the machinery space housing the main fire pump. The pump shall be capable of producing at least one jet of water from any hydrant, hose and nozzle with which the vessel is supplied in compliance with this Section while maintaining a pressure of at least 200 kilopascals at any hydrant in the vessel.

1.1.2 a portable independently driven power operated pump. The sea suction shall be by means of a portable hose of such length and so fitted and weighted that under all conditions of loading and trim of the vessel, and under weather conditions liable to be encountered in service, the suction end of the hose will remain submerged. The material of the suction hose shall be suitable for use in a sea water environment and the construction shall be such that the hose will not collapse under the effect of the pump suction. The suction hose and its connections shall be of sufficient strength to withstand any forces imposed when the pump is operating under any conditions likely to be encountered in service. The unit shall be of robust construction, designed for pumping sea water and for operation in a marine environment. The prime mover shall be a compression ignition engine and the fuel tank shall have a capacity sufficient for a minimum for 3 hours operation at full load. The complete unit shall be portable and be capable of being handled by two persons. The pump shall be self priming and the strength of construction and fitting shall be sufficient to withstand any forces which may be imposed when the pump is operating. The pump shall be stowed in a position where it is readily available for use. The pump shall be capable of producing at least one jet of water from any hose and nozzle with which the vessel is supplied, in compliance with this Section while maintaining a pressure of at least 300 kilopascals at the pump outlet;

1.1.3 a fixed manually operated pump with a fixed sea suction line. The sea suction valve, suction pipeline and delivery pipeline shall not be located in or pass through the machinery space housing the main fire pumps. The unit shall be of robust construction, designed for pumping sea water and for operation in a marine environment. It shall be full rotary, horizontal reciprocating or diaphragm type and shall be capable of delivering the required jet of water when operating at not more than 60 turns per minute in the case of a double acting horizontal reciprocating or diaphragm pump, or 60 double strokes per minute in the case of a single acting horizontal reciprocating or diaphragm pump. When fitted in the vessel, the pump shall be capable of delivering the required jet of water from any fire hose and nozzle with which the vessel is furnished, when the hose and nozzle are coupled to any deck fire hydrant which may discharge water delivered by that pump; or

1.1.4 a fixed or portable manually operated pump with a portable sea suction line. The sea suction shall be means of a portable hose of such length and so fitted and weighted that under all conditions of loading and trim of the vessel, and under weather conditions liable to be encountered in service the suction end of the hose will remain submerged. The material of the suction hose shall be suitable for use in a sea water environment and the construction shall be such that the hose will not be collapsed under the effect of the pump suction. The suction hose and its connections shall be of sufficient strength to withstand any forces imposed when the pump is operating under any conditions likely to be encountered in service. The unit shall be of robust construction, designed for pumping sea water and for operation in a marine environment. It shall be full rotary, horizontal reciprocating diaphragm type and shall be capable of delivering the required jet of water when operating at not more than 60 turns per minute in the case of a rotary pump 80 single strokes per minute in the case of double acting horizontal reciprocating or diaphragm pump, or 60 double strokes per minute in the case of a single acting horizontal reciprocating or diaphragm pump. When fitted in the vessel the pump shall be capable of delivering the required jet of water from any fire hose and nozzle with which the vessel is furnished, when the hose and nozzle are coupled to any deck fire hydrant which may discharge water delivered by that pump, provided that the nozzle of any hose for use with a manually operated pump shall have a diameter of 9.5 millimetres and reference to a required jet of water in paragraph 1.1.3 and this paragraph shall mean a jet delivered from the 9.5 millimetres diameter nozzle held horizontally three feet above the deck, the discharged water striking the deck at a distance of not less than 6 metres from the nozzle.

## APPENDIX D

### FIREMAINS, WATER SERVICE PIPES, HYDRANTS, HOSES AND NOZZLES

#### 1. Firemains, water service pipes and hydrants

1.1 In every vessel which is required by this Section to be provided with fire pumps operated by power, the diameter of the firemain and of the water service pipes connecting the hydrants hereto shall be sufficient for the effective distribution of the maximum discharge required by this Section from—

1.1.1 where only one pump is required that pump;

1.1.2 where two such pumps are so required, both pumps operating simultaneously; or

1.1.3 where more than two such pumps are so required, the two largest of such pumps operating simultaneously provided that in any vessel other than a passenger vessel the diameter of the firemain and of the water service pipes shall be required to be sufficient only for the discharge of 140 cubic metres per hour.

1.2 Where the fire pumps required by this Section are discharging the quantity of water required by sub-item 1.1 through adjacent fire hydrants in any part of the vessel to which are coupled fire hoses fitted with nozzles of sizes specified in item 2 of this Appendix the following minimum pressure shall be capable of being maintained at any hydrant;

## 1.2.1 in any passenger vessel

- (a) of 4000 tons and over—310 kilopascals; or
- (b) of 1000 tons and over but less than 4000 tons—275 kilopascals; or
- (c) of less than 1000 tons—200 kilopascals.

## 1.2.2 in any vessel other than a passenger vessel

- (a) of 6000 tons and over—275 kilopascals; or
- (b) of 1000 tons and over but less than 6000 tons—255 kilopascals; or
- (c) of less than 1000 tons—200 kilopascals.

1.3 Where any vessel is required by this Section to provide two jets of water under the conditions required by this Section, hydrants sufficient in number shall be so positioned as to enable at least two jets of water not emanating from the same hydrant, one of which shall be from a single length of hose to reach any part of the vessel normally accessible to the passengers or crew while the vessel is being navigated and to any store room and any part of any cargo space when empty.

1.4 Where any vessel is required by this Section to provide one jet of water under the conditions required by this Section, hydrants sufficient in number shall be so positioned as to enable one jet of water from a single length of hose to reach any part of the vessel normally accessible to the passengers or crew while the vessel is being navigated, and any store room and any part of any cargo space when empty.

1.5 The firemain shall have no connections other than those necessary for fire-fighting and washing down.

1.6 Materials readily rendered ineffective by heat shall not be used for firemains unless adequately protected. The pipes and fire hydrants shall be so placed that the fire hoses may be easily coupled to them. In vessels which may carry deck cargo, the fire hydrants shall be so placed that they are always readily accessible and the pipes shall be so arranged as far as practicable to avoid risk of damage by such cargo. Unless there is provided one fire hose and nozzle for each fire hydrant in the vessel there shall be complete interchangeability of fire hose couplings and nozzles.

1.7 Valves of the screw lift type or cocks shall be fitted in such positions on the pipes that any of the fire hoses may be removed while the fire pumps are at work.

1.8 The waterpipes shall not be made of cast iron and if made of iron or steel shall be galvanised.

1.9 Where wash deck lines are not self draining, suitable drain cocks shall be fitted to avoid damage by frost.

1.10 When a fire pump required by this Section is delivering water through one of the hoses and nozzles provided the pressure at any hydrant in the vessel shall not exceed 690 kilopascals.

## 2. Hoses and nozzles

2.1 Fire hoses provided in compliance with this Section shall not exceed 18 metres in length except that in vessels having a breadth of 27 metres or more the length of the fire hoses for exterior locations and for cargo spaces shall not exceed 27 metres in length. The fire hoses shall be provided with couplings, branch pipes, plain nozzles and other necessary fittings. Fire hoses furnished in boiler and machinery spaces shall in addition be provided with a spray nozzle.

2.2 Fire hoses provided to a Class 1 vessel and a Class 2A vessel shall be made of closely woven flax, canvas or other suitable material.

2.3 Fire hoses provided to a Class 2B vessel shall have a minimum internal diameter of 19 mm which is suitable for a working pressure up to and including 1035 kilopascals.

2.4 Every fire hose provided in compliance with this Section, together with the tools and fittings necessary for its use, shall be kept in a conspicuous position near the hydrants or connections with which it is intended to be used.

2.5 In vessels of Classes 1 and 2, fire hoses provided in compliance with this Section shall not be used for any purpose other than extinguishing fire or testing with fire appliances.

2.5.1 Every vessel which is required by this Section to be provided with fire pumps operated by power shall be provided with nozzles of 12 mm, 16 mm or 19 mm in diameter or as near thereto in diameter as possible.

2.5.2 For machinery spaces and exterior locations, the diameter of the nozzles shall be such as to obtain the maximum possible discharge from the minimum number of jets of water and at the pressure required by this Appendix from the smallest fire pump permitted by sub-item 1.3 of this Appendix; provided that the diameter of the nozzles shall not be required to be greater than 19 mm.

2.5.3 For accommodation and service spaces the diameter of the nozzles shall not be required to be greater than 12 mm.

2.5.4 Every spray nozzle provided in compliance with this Section shall be capable of producing a water spray suitable for extinguishing oil fires and shall be provided in addition to any plain nozzle required by sub-item 2.1; provided that a dual purpose nozzle capable of producing alternately such a spray and a plain water jet may be provided in substitution. Every spray nozzle provided shall be capable of being fitted to every hose.

## APPENDIX E

## FIXED FIRE EXTINGUISHING INSTALLATIONS

This Appendix applies to every fixed fire extinguishing installation fitted in compliance with this Section.

## 1. General

1.1 Where an unmanned machinery space is required by this Section to be fitted with a fixed extinguishing installation complying with this Appendix, the space shall be fitted with means for detecting the products of combustion prior to or resulting from an outbreak of fire in the space.

1.2 No part of the control, storage or generating arrangement of any fixed fire extinguishing installation shall be fitted forward of the collision bulkhead in any passenger vessel.

1.3 Every fixed fire extinguishing installation shall be so arranged that a fire in any of the spaces it protects will not render the controls inaccessible or put the installation out of action.

1.4 If the engine and boiler rooms are not entirely separated from each other by a bulkhead, or if fuel oil can drain from the boiler room into the engine room, the combined engine and boiler rooms shall for the purpose of this Appendix be regarded as a single space.

1.5 Operating instructions in clear and permanent lettering shall be affixed to every fixed fire extinguishing installation or in a position adjacent thereto.

1.6 Automatic means shall be provided for giving audible warning to persons within the space when fire smothering gas of a manually operated system is about to be released into any working space. Where an emergency power system is required to be fitted when the audible alarm shall be connected to both power systems.

## 2. Fixed Fire Smothering Gas or Steam Smothering Installations

### 2.1 General

2.1.1 In every such installation provided for the injection of gas or steam into machinery or cargo spaces for fire extinguishing purposes, the pipes for conveying the gas or steam shall be provided with control valves or cocks, which shall be so placed that they will be easily accessible and not readily cut off from use by an outbreak of fire. Such control valves or cocks shall be permanently marked to indicate clearly the compartments to which the pipes are led. Suitable provision shall be made to prevent inadvertent admission of the gas or steam to any compartment. Where a cargo space fitted with a gas or steam smothering system for fire protection are used as passenger spaces, the smothering gas or steam pipe connection shall be blanked during service as a passenger space.

2.1.2 The piping shall be so arranged to provide effective distribution of fire smothering gas or steam. Where steam is used in any hold exceeding 18 metres in length there shall be at least two pipes, one of which shall be fitted in the forward part and one in the after part of the hold. Except in tankers and vessels used for the conveyance of coal, pipes for conveying steam shall be fitted with outlets as low as practicable in the space which they serve and as nearly as possible to the centre line of the space.

2.1.3 In tankers the piping shall be so arranged that the steam or fire smothering gas will be distributed over the surface of the cargo.

2.1.4 Gas cylinder storage rooms shall be situated in safe position where there will be no risk to anyone from leakage and otherwise be to the satisfaction of the Marine Board. Readily accessible means to rooms shall be provided—where practicable these shall be from the open deck and in any case be independent of the protected space. Access doors shall be gas tight and bulkheads and decks which form the boundaries of such rooms shall be gas tight and adequately insulated. The rooms shall be dry, well lighted and effectively ventilated.

The gas cylinders shall be accessible, effectively secured and must not be exposed to corrosion or subjected to a temperature exceeding 60 degrees(C).

### 2.2 Carbon Dioxide

2.2.1 When carbon dioxide is used as the extinguishing medium in cargo spaces, the quantity of gas available shall be sufficient to give a minimum volume of free gas equal to 30 per cent of the gross volume of the largest cargo compartment in the vessel which is capable of being sealed. When carbon dioxide is used as an extinguishing medium for spaces containing boilers or machinery, the quantity of gas carried shall be sufficient to give a minimum quantity of free gas equal to the larger of the following quantities, either:

2.2.1.1 40 per cent of the gross volume of the largest space containing boilers or machinery, such volume being measured up to the level at which the horizontal area of the casing is 40 per cent or less of the gross area of such space; or

2.2.1.2 35 per cent of the gross volume of the largest space containing boilers or machinery, including the casing, provided that the aforesaid percentages may be reduced to 35 per cent and 30 per cent respectively for vessels of less than 2000 tons, not being passenger vessels and provided that if two or more spaces containing boilers or machinery are not entirely separate they shall for the purposes of this sub-item be considered as forming one compartment.

2.2.1.3 In calculating the gross volume of a machinery space in a motor vessel in which a main engine starting air tank is fitted there should be added to the volume of the space a volume equivalent to the volume of air at atmospheric pressure which may be released into the machinery space from a relief valve of fusible plug on that tank.

2.2.1.4 When carbon dioxide is used as the extinguishing medium both for cargo spaces and for spaces containing boilers or machinery, the quantity of gas shall not be required to be more than the maximum required either for the largest cargo compartment or machinery space.

2.2.1.5 For the purpose of this sub-item the volume of gas shall be calculated at 0.56 cubic metres to the kilogram.

2.2.1.6 When carbon dioxide is used as the extinguishing medium for any space containing boilers or machinery, the fixed piping system shall be such that 85 per cent of the gas required to provide the concentration referred to in sub-paragraphs 2.2.1.1 and 2.2.1.2 when applied to the space concerned, can be discharged into that space within two minutes.

2.3 Bromochlorodifluoromethane (Halon 1211) or Bromotrifluoromethane (Halon 1301).

2.3.1 When these gases are used as an extinguishing medium for fixed installations in spaces containing boilers or machinery, the quantity of gas carried shall be sufficient to give a minimum quantity of free gas equal to 5.5 per cent of the gross volume of the largest space containing machinery including the casing.

2.3.2 For the purpose of this sub-item the volume of Halon 1211 shall be calculated at 0.14 cubic metres to the kilogram and Halon 1301 at 0.16 cubic metres to the kilogram.

2.3.3 When the gases are used as the extinguishing media for any space containing boilers or machinery, the fixed piping system shall be such that the gas required to provide the concentration referred to in paragraph 2.3.1 when applied to the space concerned, can be discharged into that space within ten seconds.

### 2.4 Steam

When steam is used as the extinguishing medium in cargo spaces, the boiler or boilers available for supplying steam shall have an evaporation of at least 1 kilogram for each 0.75 cubic metres of the gross volume of the largest cargo compartment. The arrangement shall be such that steam will be available immediately and will not be dependent on the lighting of boilers and that it can be supplied continuously until the end of the voyage in the quantity required by this sub-item, in addition to any steam necessary for the normal requirements of the vessel including propulsion and that provision is made for extra feed water necessary to meet this requirement.

### 2.5 Inert Gas

When a system producing inert gas is used to provide smothering gas in a fixed fire smothering installation for cargo spaces, it shall be capable of producing hourly a volume of free gas at least equal to 25% of the gross volume of the largest compartment protected in this way for a period of 72 hours.

### 3. Fixed Low Expansion Foam Fire Extinguishing Installation

3.1 Every fixed foam fire extinguishing installation fitted in compliance with this Section shall be capable of discharging through fixed discharge outlets in not more than 5 minutes, a quantity of foam sufficient to cover to a depth of 150 millimetres the largest single area over which oil fuel is liable to spread. Such installation shall be capable of generating foam suitable for extinguishing oil fires and means shall be provided for the effective distribution of the foam through a permanent system of piping and control valves or cocks to discharge outlets, and for the foam to be effectively directed by fixed sprayers on other main oil fire hazards in the protected space either simultaneously or separately. Such installation shall include mobile sprayers ready for immediate use in the firing area of the boiler and in the vicinity of the oil fuel unit.

3.2 Every fixed foam fire extinguishing installation fitted in lieu of fixed fire smothering gas installation required in this Section to be provided in the oil cargo spaces of any tanker shall be capable of distributing on the decks over the oil cargo tanks through fixed discharge outlets in not more than 15 minutes a quantity of foam sufficient to cover to a depth of at least 50 millimetres the whole of the tank deck area. Such installation shall be capable of generating foam suitable for extinguishing oil fires and means shall be provided for the effective distribution of the foam through a permanent system of piping and control valves or cocks to discharge outlets. There shall be sufficient mobile foam sprayers, capable of being connected to the installation whereby foam can be directed into any tank. For the purpose of this sub-item "tank deck area" means an area equivalent to the extreme length of the cargo tanks multiplied by the breadth of the vessel.

### 4. Fixed High Expansion Form Fire Extinguishing Installation

4.1 Every fixed high expansion foam system fitted in compliance with this Section, shall be capable of rapidly discharging through fixed discharge outlets a quantity of foam to fill the greatest space to be protected at a rate of at least 1 m in depth per minute. The quantity of foam forming liquid available shall be sufficient to produce a volume of foam equal to five times the volume of the largest space to be protected. The expansion ratio of the foam shall not exceed 1000 to 1.

4.2 The arrangement of the foam generator, its source of power supply, its foam forming liquid and control system shall be readily accessible and simple to operate and so that it is not likely to be cut off by the fire.

### 5. Fixed Pressure Water Spraying System

5.1 Every fixed pressure water spraying system fitted in compliance with this Section shall be provided with a pump, piping system, control valves and spraying nozzles. On the discharge side of the control valves the distribution system shall be of the dry pipe type.

5.2 The spraying nozzles shall be of such a type, sufficient in number and so arranged as to ensure distribution of water spraying such as will effectively extinguish oil on fire in the spaces protected thereby. Spraying nozzles shall be fitted above bilges, tank tops and other areas over which oil fuel is liable to spread and above other main fire hazards in the spaces to be protected.

Application rates for particular fire risks are listed in Table 5.2

Table 5.2

Fire risk	Minimum application rate in litres per square metres per minute
Boiler fronts or roof firing areas oil fuel units, centrifugal separators oil fuel purifiers and clarifiers .....	20
Hot oil fuel pipes near exhaust pipes or similar heated surfaces on main or auxiliary diesel engines .....	10
Tank top area, oil tanks not forming part of the vessel's structure	5

5.3 The water spraying system may be divided into sections and shall be controlled from distribution manifolds, the valves of which shall be capable of being operated from easily accessible positions outside the spaces to be protected and which will not be readily cut off by an outbreak of fire.

5.4 The water spraying system shall:

- be kept charged up to the distribution manifold at the necessary pressure and the pump supplying water for the system shall be automatically put into action by a pressure drop in the system; or
- be arranged such that the pump supplying water for the system is capable of being started at each distribution control valve operating position.

5.5 The pump shall be capable of supplying water at the necessary pressure simultaneously to all sections of the water spraying system in any one compartment to be operated.

Where a vessel is provided with a fixed water spray system for the protection of more than one space with supply from a single pump the pump capacity need only be sufficient for the largest single duty.

5.6 The pump supplying water for the system shall be provided exclusively for the purpose.

The pump and its controls shall be installed outside the space or spaces to be protected.

The sea inlet to the pump shall be in the space containing the pump and shall be so arranged that when the vessel is afloat it will not be necessary to shut off the supply of sea water to the pump for any purpose other than the inspection or repair of the pump. Pump suction chambers shall be flooded at all times when the vessel is in service.

5.7 Means shall be provided to prevent the pump, piping, nozzles and valves becoming clogged by impurities in the water or by corrosion.

A strainer shall be fitted on the suction side of the pump.

5.8 The piping system shall be of a corrosion resistant material, for example galvanised steel and as the "dry pipe" principle is involved due regard shall be paid to heat resistance of material used and the possibility of it being subject to very high temperature to the introduction of water.



## 2. Portable fire extinguishers

2.1 Reference to a portable fire extinguisher in this Section means a fire extinguisher which does not exceed 25 kilograms in weight in the fully charged condition and that:

2.1.1 in the case of a fire extinguisher in which the fire extinguishing medium is liquid, has a capacity of not more than 13 and a half litres and not less than 9 litres of liquid;

2.1.2 in the case of a fire extinguisher in which the fire extinguishing medium is carbon dioxide, has a capacity of not less than 3 kilograms of carbon dioxide, provided that, in the case of a vessel less than 5 metres in length, the Marine Board may allow a capacity of not less than one kilogram of carbon dioxide; or

2.1.3 in the case of a fire extinguisher in which the fire extinguishing medium is dry powder, has a capacity of not less than 4.5 kilograms of dry powder, provided that in the case of a vessel less than 5 metres in length, the Marine Board may allow a capacity of not less than 0.9 kilograms of dry powder.

2.2 In the case of all vessels to which this Section applies reference to a portable fire extinguisher shall mean, in addition to a portable fire extinguisher complying with sub-item 2.1 of this Appendix, a fire extinguisher in which the fire extinguishing medium is bromochlorodifluoromethane (B.C.F.) and which has a capacity of not less than 1.5 kilograms and not more than 14 kilograms of B.C.F. provided that in the case of a vessel less than 5 metres in length, the Marine Board may allow a capacity of not less than 0.9 kilograms and not more than 14 kilograms of B.C.F.

2.3 Portable fire extinguishers provided in compliance with this Section for use in accommodation or service spaces of any vessel shall so far as practicable have a uniform method of operation.

2.4 Portable fire extinguishers provided in compliance with this Section shall, subject to the limitations of sub-item 2.2 and 2.3 be constructed in accordance with the following specification of the Standards Association of Australia or other standards approved by the Marine Board.

Type of Extinguisher	Specification Number
Water (Splash-proof type)	AS 1840 to 1842
Foam (Splash-proof type)	AS 1843 to 1845
Dry Chemical	AS 1846
Carbon Dioxide	AS 1847
Bromochlorodifluoromethane	AS 1848

and shall bear the Standards Association of Australia mark or other appropriate mark together with their licence number.

2.5 Where portable dry powder fire extinguishers are provided in compliance with this Section, in either accommodation and service spaces or in machinery spaces, their number shall not exceed one half of the total number of extinguishers provided in either of those spaces. Where only one extinguisher is required in a space, it may be of the dry powder type.

5.9 The water spraying system shall include mobile sprayers ready for immediate use in the firing area of the boiler or in the vicinity of the oil unit.

5.10 The system shall be so arranged that it shall not be possible for a fire in the space or spaces protected to put the system out of action.

5.11 No part of the water spraying system shall be situated forward of the collision bulkhead in any passenger vessel.

## APPENDIX F

### FIXED FIRE EXTINGUISHING INSTALLATIONS

1. A fixed fire extinguisher may be fitted inside or outside the machinery space it is to protect but must be capable of discharging into that space. If the extinguisher is not fitted with means for rapidly injecting fire smothering gas into the space automatically on a predetermined rise of temperature within the space means shall be provided:

- (1) for actuating the extinguisher from outside the space; and
- (2) for detecting the products of combustion prior to or resulting from an outbreak of fire in the machinery space.

2. In a fixed automatically operated fire extinguishing installation:

- (1) the extinguishing medium shall be bromochloro—difluoromethane, or bromotrifluoromethane; and
- (2) the automatic thermally operated discharge head shall be adequately protected to prevent mechanical damage.

3. The extinguishing medium for a manually operated fixed fire extinguishing installation shall be bromochlorodifluoromethane, bromotrifluoromethane or carbon dioxide.

4. The extinguisher shall be capable of rapidly injecting into the space:

4.1 where the vessel is not mainly or wholly constructed of steel or material of an equivalent fire rating—1.5 times the quantity of fire smothering gas required by Appendix E, and

4.2 when the vessel is constructed of steel or a material of an equivalent fire rating or when the vessel is not mainly constructed of steel or material of an equivalent fire rating but the machinery space is bounded by steel or material of an equivalent fire rating, the quantity of gas required by Appendix E.

5. Fire extinguishers provided in compliance with this Appendix, other than a carbon dioxide fire extinguisher, shall be tested by hydraulic pressure to within 345 kilopascals of the pressure to which it was tested at the time of its manufacture, and recharged, at intervals not exceeding the intervals specified in the following table:

Type of extinguisher	Recharge interval in years	Test interval in years
Halogenated hydrocarbon		
Gas container .....	5	5
Stored pressure .....	5	5

## FIRE EXTINGUISHERS

## 1. General provisions

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

1.2 For the purpose of this Section the capacity of any fire extinguisher other than a carbon dioxide fire extinguisher shall be taken to be the greatest volume or weight of extinguishing medium which it can contain when sufficient space is left to ensure the proper operation of the extinguisher.

1.3 For the purpose of this Section the capacity of a carbon dioxide fire extinguisher shall be taken to be the greatest weight of carbon dioxide which it can safely contain in a tropical climate.

1.4 Every fire extinguisher provided in compliance with this Section shall be kept fully charged at all time.

1.5 Fire extinguishers provided in compliance with this Section, other than a carbon dioxide fire extinguisher, shall be tested by hydraulic pressure to within 345 kilopascals of the pressure to which it was tested at the time of its manufacture, and recharged at intervals not exceeding the intervals specified in the following table:

Type of extinguisher	Recharge interval in years	Test interval in years
Water		
Soda acid		
Gas container	1	5
Stored pressure	5	5
Foam	5	5
Chemical		
Gas container:	1	5
Premixed foam liquid type		
Sealed foam liquid container type	5	5
Dry Chemical		
Stored pressure	5	5
Halogenated hydrocarbon		
Stored pressure	5	5

1.6 Every portable and non-portable carbon dioxide fire extinguisher provided in compliance with this Section shall be tested in accordance with standards approved by the Marine Board and having due regard to the requirements of AS2030, SAA Gas Cylinders Code, except that the interval between tests shall not exceed 10 years for the first and second tests and the interval between all subsequent tests shall not exceed 5 years. If the extinguisher has been discharged at a time exceeding 2 years after its previous test, it shall be pressure tested prior to recharging and the interval between subsequent tests shall not exceed 5 years.

2.6 In the case of vessels of Classes 1 and 2 which have a length of 25 metres or over, a spare charge shall be provided for every portable fire extinguisher provided in compliance with this Section, except that for each such fire extinguisher which is of a type that cannot readily be recharged while the vessel is at sea, an additional portable fire extinguisher of the same type, or its equivalent shall be provided in lieu of a spare charge.

## 3. Non portable foam fire extinguishers

3.1 In this item "foam fire extinguisher" does not include a portable fire extinguisher.

3.2 An extinguisher shall be of the antisplash type and so designed and constructed that the interior of the extinguisher can be examined.

3.3 The body of an extinguisher shall be cylindrical with ends dished outwards, without reverse flanging, to a radius not exceeding the diameter of the body.

3.4 The body and ends of an extinguisher shall be tinned or lead-coated internally and every part of the extinguisher shall, where necessary, be protected against corrosion.

3.5 The body of an extinguisher shall be welded or riveted and all riveted joints shall be soldered.

3.6 The body of an extinguisher shall be provided with an opening for the introduction of an inner container.

3.7 The opening shall be—

3.7.1 fitted with a screw cap of gun-metal or other suitable material; and

3.7.2 screwed with a continuous thread through the side of which safety holes or slots are provided so that when the cap is being removed any pressure of gas remaining in the container will be released gradually should the discharge opening be choked.

3.8 The cap joint shall be made with acid resisting rubber, greased leather or other suitable material.

3.9 If the extinguisher is provided with an inner container, the container shall be adequately supported.

3.10 A reinforced discharge hose of suitable length together with a nozzle, shall be provided for an extinguisher.

3.11 The area of the nozzle shall be such that, when the extinguisher is operated the foam is projected:

3.11.1 in the case of an extinguisher of 135 litres or more for a distance of not less than 14 metres for a period of not less than one hundred seconds; or

3.11.2 in any other case for a distance of not less than 10.5 metres for a period of not less than ninety seconds.

3.12 The charge and the air space above the level of the liquid in the body of an extinguisher shall be so regulated that the maximum pressure in the extinguisher when put into action with all outlets closed does not exceed two megapascals at a temperature of thirty-eight degrees Celsius.

3.13 An extinguisher shall be capable of withstanding for a period of five minutes and internal pressure equal to—

3.13.1 a pressure greater by one-half than the maximum pressure in the extinguisher when put into action with all outlets closed; or

3.13.2 a pressure of 2.5 megascals whichever is the greater.

3.14 The outside of an extinguisher shall be clearly and permanently marked with

3.14.1 a mark showing the level of the liquid when the extinguisher is filled to its working capacity; and

3.14.2 A statement setting out

- the name of the maker or vendor of the extinguisher;
- the capacity of the extinguisher;
- the pressure under which the extinguisher was tested;
- instructions for operating the extinguishers; and
- the year in which the extinguisher was manufactured.

#### 4. Non-portable Carbon Dioxide fire extinguishers

4.1 A carbon dioxide fire extinguisher, other than a portable fire extinguisher shall be provided with cylinders constructed in accordance with approved standards.

4.2 Each cylinder shall be provided with an internal discharge tube and a valve to release the gas.

4.3 An extinguisher shall be provided with a discharge hose of suitable length reinforced so as to withstand a pressure of 12.4 megapascals when the necessary couplings are fitted.

4.4 The bore of the discharge hose shall not be less than 12.5 mm.

4.5 The discharge hose shall be provided with a horn that is insulated and of a design which will reduce the velocity of the gas discharged.

4.6 Any temperature between 10 degrees Celsius and 21 degrees Celsius inclusive, the extinguisher shall be capable of discharging gas at such a rate that carbon dioxide equal in weight to three-quarters of the capacity of the container will be discharged in 70 seconds.

4.7 The outside of the extinguisher shall be clearly and permanently marked with a statement setting out—

- the name of the maker or vendor of the extinguisher;
- the weight of the extinguisher when empty and the weight when filled to its working capacity;
- instructions for operating the extinguisher; and
- the year in which the extinguisher was manufactured.

### APPENDIX H

#### FIREMEN'S OUTFIT

1. Every fireman's outfit carried in compliance with this Section shall consist of:

1.1 a breathing apparatus complying with the requirements specified in Appendix I of this Section;

1.2 a portable self-contained electric battery operated safety lamp capable of functioning efficiently for a period of at least three hours; and

1.3 a fireman's axe.

2. Where more than one such outfit is provided they shall be kept in readily accessible and widely separated positions which are not likely to be cut off in the event of fire.

### APPENDIX I

#### BREATHING APPARATUS

1. A breathing apparatus provided in compliance with this Section may be either—

1.1 a smoke helmet or a smoke mask, each of which shall be provided with an air pump or bellows and an air hose; or

1.2 a self-container breathing apparatus.

2. General provisions

2.1 A breathing apparatus furnished in a vessel in accordance with this Section shall be constructed of materials having adequate mechanical strength, durability and resistance to deteriorating by heat or by contact with sea water and such materials shall be resistant to fire. The fabric used in the construction of any harness provided with a breathing apparatus shall be resistant to shrinkage. Where a cargo vessel, constructed or adapted for the carriage of bulk fluid cargoes of a flammable nature, is furnished with a breathing apparatus, all exposed metal parts of the apparatus, harness and fittings shall be materials resistant to frictional sparking.

2.2 Each breathing apparatus shall be legibly and indelibly marked with the year of manufacture and the manufacturer's name, trade mark or the registered mark.

2.3 Each breathing apparatus shall be provided with operating instructions in clear and permanent lettering on a plate for attachment to the apparatus or for display in a clearly visible position near the apparatus stowage position.

3. The following equipment shall be provided for use with each set of breathing apparatus:

3.1 a fire-proof life-and -signalling-line capable of being attached to the belt or harness of the breathing apparatus by the wearer by means of a snap-hook. The line shall be 3 metres longer than is required to reach from the open deck in clear air well clear of any hatch or doorway to any part of the accommodation, service, cargo or machinery spaces. The line shall be made of copper or galvanised steel wire rope having a breaking strength of at least 5 kilonewtons and shall be overlaid up to at least 10 millimetres in diameter by hemp or other covering to provide a surface which can be firmly gripped when wet;

3.2 means for protecting the eyes and face of the wearer against smoke where the face-piece of the breathing apparatus does not provide such protection;

3.3 for every apparatus other than a smoke helmet, a lightweight safety helmet with lining and adjustable head band; and

3.4 plates of suitable material which is not readily combustible bearing the following code of signals to be used between the wearer and his attendant, one of which shall be attached to the harness and another attached to the free end of the lifeline.

Signal	Meaning
<b>By wearer of breathing apparatus</b>	
2 pulls.....	Slack Off Lifeline
3 pulls.....	Help me out immediately
<b>To wearer of breathing apparatus</b>	
3 pulls.....	Come out immediately

#### 4. Smoke helmet or mask and its fittings

4.1 Smoke helmet or smoke mask shall be fitted with a pump or bellows for the supply of air and the air inlet to the pump or bellows shall be so protected as to ensure that the supply of air cannot be obstructed. The air supply hose shall be sufficient in length to enable the air pump or bellows to be on the open deck in clear air well clear of any part of the accommodation, service, cargo or machinery spaces.

4.2 A smoke helmet or smoke mask shall otherwise comply with the following requirements—

The design and construction shall be such that it will

- provide the wearer with air from an uncontaminated source for an indefinite period;
- prevent entry of the external atmosphere;
- permit the component parts likely to require service to be readily detached for maintenance but be secure against accidental disconnection; and
- ensure that couplings provide a secure, gas-tight joint and that when detached, washers are retained in position.

4.2.2 The waist belt or body harness shall be so designed that it causes no undue discomfort or limitation of movement to the wearer. The full weight of the trailing air hose shall be supported solely by the waist belt or body harness and there shall be no drag on the breathing tube or face piece.

4.2.3 The attachment or clip connecting the hose to the waist belt or body harness shall be so designed and constructed that whatever the direction of pull, the hose is not damaged nor is the supply of air reduced.

4.2.4 Provision shall be made on the waist belt or body harness for attachment and detachment by the wearer of a life and signalling line fitted with a snap hook.

4.2.5 The air hose shall be of rubber, plastic, a combination of both or other suitable material. It shall be flexible and non-kinking and shall comply with the requirements of paragraph 4.2.10 of this Appendix.

4.2.6 The air hose shall not be less than 18 mm internal diameter and shall not exceed 36 metres in length.

4.2.7 The apparatus shall include a breathing bag of 5 to 7 litres capacity.

4.2.8 The pump or bellows shall be capable of delivering to the breathing bag via the air hose not less than 85 litres of air per minute.

4.2.9 The resistance of the assembly when subjected to a continuous stream of air at a rate of 85 litres per minute shall not exceed 152 mm of water column.

4.2.10 Tests for the air hose shall be as follows:

- The strength of the air hose and couplings shall be such that when tested with a steady longitudinal pull of 1.11 kilonewtons applied for one minute there shall be no separation of the couplings, failure of the hose or failure of the connection of the couplings to the hose.
- The resistance to collapse of the air hose shall be determined in the following manner. A length of air hose with its couplings shall be subjected to a load of 845 Newtons applied between two plane surfaces 75 mm square and on opposite sides of the hose and at right angles to its length whilst air is flowing through it at a rate of 85 litres per minute. Any portion of the hose and couplings may be so tested. The flow of air through the hose shall not be reduced to such an extent that the resistance requirements of paragraph 4.2.9 of this Appendix cannot be met and there shall be no appreciable residual distortion of the hose when the pressure has been released.
- The air hose and couplings shall not leak when immersed in water and subjected to an internal air pressure of 13.8 kilopascals. The test shall be applied after the hose and couplings have been submitted to the strength of hose and couplings have been submitted to the strength of hose and couplings test described in sub-paragraph 4.2.10(a) of this Appendix and the couplings shall not be interfered with between tests. The flexible tube connected to the face piece shall be subjected to this test for air tightness, but shall not be subjected to this test for air tightness, but shall not be subjected to the tests for air tightness, but shall not be subjected to the tests described in sub-paragraph 4.2.10(a) and 4.2.10(b) of this Appendix.

4.2.11 In testing the apparatus it shall be worn in turn by five persons. After the apparatus has been correctly adjusted each wearer shall enter a gas chamber containing a concentration of 8 mg per cubic metre of orthochlorobenzal malononitrile in air. The wearer shall then ascend and descend at a rate of twelve times per minute two steps each having a 220 mm rise and this he shall continue to do for ten minutes.

4.2.12 Whilst carrying out this test the wearer shall not detect any of the test gas in the inhaled air nor experience any undue impairment of efficiency or discomfort on account of fit, the air delivery or any other feature of the apparatus.

#### 5. Self-contained breathing apparatus

5.1 Every self-contained breathing apparatus provided in compliance with this Section shall be of the open circuit compressed air type.

#### 5.2 Cylinders for breathing apparatus

5.2.1 Where a vessel is provided with one self-contained breathing apparatus in accordance with this Section, it shall be provided with fully charged cylinders having a spare storage capacity of at least 1200 litres of free air.

5.2.2 Where a vessel is provided with more than one self-contained breathing apparatus in accordance with this Section, it shall be provided with fully charged cylinders having a spare storage capacity of at least 2400 litres of free air.

5.3 An open circuit compressed air type breathing apparatus shall otherwise comply with the following requirements:

5.3.1 The design and construction of self-contained breathing apparatus of the compressed air, open circuit type shall be such that the apparatus will—

- (a) provide respiratory protection;
- (b) prevent entry of the external atmosphere;
- (c) permit the component parts likely to require service to be readily detached for maintenance but be secure against accidental disconnection;
- (d) ensure that couplings provide a secure, gas-tight joint and that when detached, washers are retained in position;
- (e) permit it to be worn without undue discomfort and in such a manner that it is practicable for the wearer to lift and carry and unconscious person on his shoulders, or perform other duties of rescue; and
- (f) not unduly impede the wearer when walking in a crouched attitude, crawling or manoeuvring in narrow tunnels and openings.

5.3.2 The apparatus shall consist of—

- (a) a face piece held securely in position with a head harness;
- (b) pressure hose or pipe;
- (c) outlet valve;
- (d) a lung-governed air supply device;
- (e) means of overriding the lung-governed air supply device;
- (f) cylinder(s) of compressed air;
- (g) cylinder valve;
- (h) pressure gauge;
- (i) a pressure-gauge isolating valve;
- (j) warning device to indicate when the supply of air is nearing its end; and
- (k) body harness.

5.3.3 Means shall be provided for the automatic regulation of the air supply to the wearer of the apparatus in accordance with his breathing requirements when he is breathing any volume of free air up to 85 litres per minute whilst the pressure in the cylinder or cylinders is above 1 megapascal. The effective life shall be deemed to have been reached when the pressure of air in the cylinder or cylinders has fallen so low that a flow of 38 litres per minute cannot be maintained. The storage capacity of the air cylinder or cylinders attached to the apparatus shall be at least 1200 litres of free air.

5.3.4 Any pressure pipe or hose which is exposed to the full pressure of the cylinder shall be designed and tested to withstand a pressure at least one-and-half times the full cylinder pressure. Any pressure pipe or hose which is subjected to pressure from a reducing valve shall be designed and tested to withstand a pressure at least one-and-a-quarter times the working pressure. Any hose which is attached to the face piece shall be flexible, shall permit free head movement and shall not close off by kinking or by chin or arm pressure.

5.3.5 The lung-governed air supply device shall consist of a pressure reducing valve and a demand valve either separate or in combination. The design of the device shall be such that it cannot be operated accidentally, it is adequately protected against damage, and its efficiency is not impaired by any heat or moisture likely to be encountered in use. Where the device includes adjustable reducing valve, it shall incorporate a suitable locking device to prevent the adjustment being altered accidentally.

5.3.6 Compressed air shall—

- (a) contain not less than 21 per cent nor more than 22 per cent by volume of oxygen;
- (b) not contain more than 0.002 per cent by volume of carbon-monoxide; and
- (c) be odourless, and free from oil and other impurities.

5.3.7 Cylinders shall comply with the requirements of a recognised standard. Manufacturers and suppliers should ensure that cylinders are tested, marked and certificated in order that they may be filled to capacity at FII filling stations.

5.3.8 The cylinder valve shall comply with the requirements of a recognised standard. The valve shall be operated by a hand wheel distinguishable by touch from any other hand wheel in the apparatus and shall be so designed and positioned that it can easily be operated by the wearer with a wet or slippery hand. The design of the valve shall be such that the spindle cannot be unscrewed completely out of the valve body. The assembly should include a trap to prevent foreign particles from the cylinder entering the circuit.

5.3.9 Pressure gauge requirements.

- (a) The pressure gauge shall be of the "visual" or "tactile" type designed to withstand a pressure of one-and-a-quarter times the maximum working pressures of the cylinder.
- (b) The size and position of the gauge shall be such that it can easily be read by the wearer when the apparatus is being worn. The dial of a visual type gauge shall be protected by non-splinterable, clear, non-flammable material. Additional protection shall be provided where necessitated by the position of the gauge.
- (c) The design of a visual type gauge shall include provision of a failure point such that in the event of rupture of the tube or diaphragm the failure point will act as a safety device to prevent the glass from being blown out.
- (d) A throttling or slow leak orifice which limits the flow of air to the gauge shall be incorporated to prevent sudden build-up of pressure.
- (e) The gauge shall be clearly marked to indicate:
  - (i) when the cylinder is full; and
  - (ii) when the cylinder capacity has been reduced by 80 per cent of its effective life.
- (f) The markings, on a circular dial, should extend over an arc of 300 degrees.

5.3.10 An isolating valve shall be provided in the pressure gauge circuit to prevent loss of air in the event of failure of the gauge, its connecting pipe or hose or any component part.

5.3.11 Means shall be provided for warning the wearer audibly when the cylinder capacity has been reduced by 80 per cent of its effective life.

5.3.12 The body harness shall be so designed as to enable the wearer to put on and take off the apparatus quickly and easily without assistance. It shall be adjustable to suit the wearer and designed to avoid undue discomfort. Provision shall be made on the harness of attachment and detachment by the wearer of a life and signalling line fitted with a snap hook.

5.3.13 The apparatus, when fully charged, should be as light as practicable and its weight should in any case exceed 16 kilograms.

5.3.14 Standards for face pieces shall be as follows:

- (a) The full piece assembly shall be tested for leakage from around the eye piece(s) and from any attachment to the face piece whilst the leakage test specified in sub paragraph 5.3.14(c) is being carried out. The periphery of the face piece and the inlet from the breathing tube shall be sealed during this test. Any leakage from these sources together with the leakage from the outlet valve assembly shall not exceed the values specified in sub-paragraph 5.3.14(c).
- (b) The performance requirements for outlet valves specified in sub-paragraphs 5.3.14(c) and 5.3.14(d) below shall apply to the whole assembly which shall include every outlet valve and every part through which exhaled air passes.
- (c) The total leakage shall not exceed 5 millimetres in 10 seconds when tested with air at a constant suction head of 25 mm water gauge. During this test the valve and its seating shall be dry.
- (d) The resistance imposed shall not exceed 20 mm water gauge when a continuous stream of air at a rate of 85 litres per minute is passed through the valve.
- (e) Tests for face piece attachments
  - (i) The device shall function so that the opening pressure and the resistance imposed shall not exceed 57 mm water gauge when a continuous stream of air at a rate up to 227 litres per minute is passed through the assembly for a period of thirty minutes.
  - (ii) After being operated for 50 hours continuously by a tidal volume of 2 litres at a rate of 20 respirations per minute, the device shall be capable of complying with the requirements of 5.3.14(e) (i) above.

5.3.15 Tests to be carried out by persons wearing breathing apparatus.

- (a) The whole apparatus shall be worn in turn by five persons. After the apparatus has been correctly adjusted each wearer shall enter a gas chamber containing a concentration of—  
10 mg/per cubic metre of chloracetophenone in air.
- (b) Each test shall be performed for a period equal to the nominal effective life of the charged cylinder.
- (c) The following tasks shall be performed whilst wearing apparatus.
  - (i) one-third of the period walking moving head from side-to-side, nodding, and bending the body at the waist;
  - (ii) one-third of the period ascending and descending at the rate of twelve times per minute two steps each having a 220 mm rise; and
  - (iii) one-third of the period walking at the rate of 6 kilometres/hour on level ground.
- (d) While carrying out the test procedure described in sub-paragraph 5.3.15(a) above, the wearer shall not detect any chloracetophenone in the inhaled air, nor experience any undue impairment of efficiency or discomfort on account of fit, the air delivery, or any other feature of the apparatus.

5.3.16 In addition to the markings required by item 2 of this Appendix, the cylinder body shall be painted light grey with black and white quadrants of shoulder.

5.3.17 Every breathing apparatus shall be provided with servicing and instruction manual.

## APPENDIX J

### INTERNATIONAL SHORE CONNECTION

1. The international shore connection required by this Section to be installed in the vessel shall be in accordance with the following specification.

Outside diameter	:	178 mm
Inner diameter	:	64 mm
Bolt circle diameter	:	132 mm
Holes	:	4 holes of 19 mm diameter equidistantly placed, slotted to the flange periphery
Flange thickness	:	14.5 mm minimum
Material	:	Any suited to 1035 kilopascals service

2. The flange shall have a flat face on one side, and to the other shall have permanently attached thereto a coupling that will fit the vessel's hydrants and hose.

3. The connection shall be kept aboard the vessel together with a gasket of any material suitable for 1035 kilopascal service, together with 4 bolts of 16 mm diameter, 50 mm in length and 4 matching nuts and 8 washers.

4. Fixed provision shall be made to enable the connection to be used on the port side and on the starboard side of the vessel to enable water to be supplied to the fire-main from another vessel or from the shore.

## APPENDIX K

### FIRE BUCKETS

1. Every fire bucket provided in compliance with this Section shall be of metal painted red and be clearly and permanently marked with the work "FIRE". Except in open vessels, every such fire bucket shall be kept filled with sand or water.

2. Except in open vessels, fire buckets provided in compliance with this Section shall not be used for any purpose other than extinguishing fire.

## APPENDIX L

### AIR—FOAM EQUIPMENT

1. A foam applicator unit shall consist of—

- 1.1 an inductor type of air—foam nozzle capable of being connected to the fire main by a fire hose;
- 1.2 a transportation tank containing at least 20 litres of froth making liquid; and
- 1.3 a spare tank.

2. The nozzle shall be capable of producing effective foam suitable for extinguishing an oil fire, at the rate of at least 1.5 cubic metres per minute.

## RADIO EQUIPMENT

## CONTENTS

1. This Section is divided into Parts as follows:

- Part 1 : Preliminary (Clauses 2—4)  
 Part 2 : Safety Convention ships (Clauses 5—6)  
 Part 3 : Non-Safety Convention ships Radio Telephony (Clauses 7—20)  
 Part 4 : Types of Radio Installations  
 (Appendices A and B)

## PART 1—PRELIMINARY

2. This Section shall be read in conjunction with the Introduction, Definitions and General Requirements Section.

3. In this Section the undermentioned terms shall have the meanings set against them respectively.

**At Sea**—in respect of radio watchkeeping is the period occupied on a voyage extending beyond Harbour and River Service limits.

**Coast Station**—a land station in the maritime mobile service open for public correspondence.

**Compatible Double Sideband**—refers to a wave, emission or signal of type A3H (see Sub-clause 4.1).

**Frequency Bands**—the frequency bands referred to in this Section are:

Medium frequency (MF), 300-3000 kHz

High frequency (HF), 3000—30,000 kHz (3-30 MHz)

Very High frequency (VHF), 30,000-300,000 kHz (30-300 MHz)

**Limited Coast Station**—a land station established by or on behalf of a public utility, the fishing industry or other commercial enterprise for the exchange of communications.

**Radio Installation**—all radiocommunication and ancillary equipment required by this Section.

**Radio Surveyor**—a person appointed by the Departments of Posts and Telecommunications to be a radio surveyor.

**Radiotelegraphy**—a system of radiocommunication for the transmission of written matter by the use of a signal code.

**Radiotelephone Distress Frequency**—the frequency of two thousand one hundred and eighty-two kHz.

**Radiotelephone Operator**—a person holding an appropriate certificate complying with the provisions of the Radio Regulations.

**Radiotelephony**—a system of radiocommunication set up for the transmission of speech or, in some cases, other sounds.

**Radio Regulations**—the Radio Regulations annexed to the most recent International Telecommunication Convention which may be in force at any time.

**Radio Watch**—listening on the appropriate Distress Frequency for the type of installation on the vessel.

**Silence Periods**—for radiotelephone vessels are periods of three minutes duration beginning at each hour and at the expiration of thirty minutes after each hour of each day, according to G.M.T.

4. in this Section:

4.1 A reference to a wave, emission or signal of type A3H shall be read as a reference to single sideband amplitude modulated radiotelephony having a carrier emitted at a level not more than 6 decibels below the peak envelope power.

4.2 A reference to a wave, emission or signal of type J3E shall be read as reference to single sideband amplitude modulated radiotelephony with the carrier emitted at a level 40 decibels or more below the peak envelope power.

## PART 2—SAFETY CONVENTION SHIPS

5. Application

5.1 This Part applies to all passenger ships irrespective of size and cargo ships of 300 tons Gross tonnage and upwards, engaged on International Voyages. (Class 1, Class 2A, and Class 2B of 300GT and upwards).

6. Compliance with the Safety Convention

6.1 Vessels referred to in sub-clause 5.1 shall comply with the relevant provisions of Chapter IV of the Safety Convention.

PART 3—NON-SAFETY CONVENTION SHIPS  
RADIO TELEPHONY

7. Application

7.1 This Part applies to:

7.1.1 All vessels in the International trade of less than 300 tons gross.

7.1.2 All vessels in the Restricted Pacific Region trade (CLASS 3A).

7.1.3 All vessels in the Fiji Islands Trade (CLASS 3B).

7.1.4 Vessels licenced to carry not less than 40 passengers in the Sea-Going Service. (CLASS 3C, not less than 40 passengers).

7.1.5 Such vessels in the Harbours and Rivers and Short Coasting Service as the Fiji Marine Board determines.

8. Provision of Radio Installation

8.1 Each vessel subject to this Part shall be equipped with a radiotelephone installation comprising a transmitter together with a separate or combined receiver, a radiation system and a main reserve source of electrical energy that comply with the detailed requirements of the Appendices indicated in the following table:

Type of vessel/and trade	Appendix
International	A (SSB) and B (VHF)
Restricted Pacific Region	A (SSB)
Fiji Islands Trade	A (SSB)
Sea-Going Service	A (SSB)
Harbour, Rivers, Short Coasting	A (SSB)
	or
	B (VHF) if position is

Vessels in the International trade which comply fully with Chapter IV of the Safety Convention in respect of Radio telegraphy need not comply with the requirements of this Part to carry S.S.B.

#### 9. Type of Radio Installation

9.1 The installations that are provided pursuant to clause 10 shall comply with the requirements of the Appendices in Part 5 of this Section.

9.2 V.H.F. equipment carried as an additional installation which provides for operation on the international distress, safety and calling frequency for the maritime mobile V.H.F. radiotelephone service 156.80 MHz (Channel 16) shall comply with the provisions of Appendix B.

9.3 All installations listed in Clause 10 are subject to the approval of the Posts and Telecommunications Department and shall comply with the standards detailed in the Appendices in Part 5 of this Section.

#### 10. Exemptions

10.1 The Posts and Telecommunications Department may consider applications for exemptions from compliance with any of the provisions of this Part.

10.2 The Posts and Telecommunications Department may grant total exemption of the following types of vessels:

10.2.1 open vessels or vessels where it is impractical to instal and maintain a radio installation;

10.2.2 vessels on voyages of not more than 35 nautical miles either side of a specified port or place and not more than 5 nautical miles off shore; and

10.2.3 vessels in company with an approved radio equipped vessel.

#### 11. Maintenance

11.1 The radiotelephone installation shall be maintained so that, while the vessel is at sea, the radiotelephone installation is at all times capable of fulfilling the requirements of this Part.

#### 12. Interference

12.1 The radiotelephone installation shall be installed in such a position and manner, and other electrical apparatus on the vessel shall be equipped with such devices that, while the vessel is at sea, effective reception of radio signals is not hindered by interference caused by electrical or other apparatus on the vessel.

#### 13. Location

13.1 The radiotelephone installation shall, to the satisfaction of the Radio Surveyor:

13.1.1 be installed in the vessel in a satisfactory manner and in as high a position as is practicable; and

13.1.2 be protected against the harmful effects of salt water and extremes of temperature.

13.2 The radiotelephone installation shall, to the satisfaction of an officer appointed by the Posts and Telecommunications Department for that purpose, be installed in such a place that it will not affect any of the vessel's compasses or other navigational equipment.

#### 14. New Installations

14.1 Before commencing to instal a radio installation in a vessel the owner or proposed owner thereof shall give early notice in writing pursuant to this Part to the posts and Telecommunications Department of the proposed radio installation, its siting and wiring.

14.2 Upon receiving any such notice, an officer appointed by the Posts and Telecommunications Department in conjunction with a Radio Surveyor shall give to the owner or proposed owner such advice as is necessary to ensure compliance with the requirements of clause 13.

#### 15. Documents

15.1 There shall be carried on board each vessel to which this Part applies:

15.1.1 a log book in which shall be entered details as to dates, times, frequencies and call signs with respect to:

(a) communications relating to tests required by clause 20; and

(b) all distress calls together with the name and position of the vessel in distress and nature of the distress and the action taken.

15.1.2 A copy of the latest edition of the "Handbook for Radiotelephone Ship Station Operators" published by the Commonwealth Department of Communications, and the Small Ships Radiotelephone Service, General Instructions issued by the Department of Posts and Telecommunications, Fiji.

#### 16. Miscellaneous Provisions

16.1 A vessel subject to the provisions of this Part shall have the following equipment fitted, in a manner approved by the Radio Surveyor, in the immediate vicinity of the radio installation:

16.1.1 a reliable clock visible to the operator;

16.1.2 in the immediate vicinity of the radio a suitable card which explains in simple terms the use of the equipment to an unskilled person for use in an emergency;

16.1.3 an emergency electric light capable of illuminating the installation controls, the clock and the card referred to above, and capable of being controlled both from the installation and every entrance to the space in which the installation is fitted; and

16.2 If the installation is not fitted in the place from which the vessel is normally navigated a loud speaker shall be installed in such place which has gain control which, when adjusted to its minimum position, permits an out put from the loud speaker of sufficient volume for the maintenance of an effective listening watch.

16.3 Protection shall be provided from accidental access to all parts and wiring of the installations which at any time are at an instantaneous voltage (other than radio frequency voltage) of over 50 volts under normal conditions of operation.

#### 17. Spare Components

17.1 For vessels engaged on International Voyages, spare components commensurate with the radio installation shall be carried on board and shall include:

17.1.1 one spare completely assembled antenna of identical characteristics for effective use on a distress frequency;



17.1.2 one of each type of valve and semi-conductor device used in the installation;

17.1.3 four of each type of fuse used in the installation; and

17.1.4 one globe for the electric light referred to in paragraph 16.1.3.

#### 18. Qualification of Operators

18.1 The radiotelephone station in each vessel must be operated by a person holding a Radiotelephone Operator's Restricted Certificate of Proficiency or equivalent, or any certificate recognised by the Posts and Telecommunications Department as appropriate for operation of the installation concerned.

#### 19. Radio Watch

19.1 Except as provided otherwise in this clause a radio watch shall be maintained on 2182 kHz at all times while the vessel is at sea.

19.2 The watch referred to in sub-clause 19.1 may, except at the silence periods be suspended:

19.2.1 whilst exchanging communications with coast, limited coast or other slip stations; and

19.2.2 when conditions are such that in the opinion of the Master such watch would interfere with the safe navigation or safe working of the vessel.

19.3 The watch referred to in sub-clause 19.1 may be suspended whilst a vessel is at anchor.

19.4 Radio watch may be maintained by means of loud speaker reception at the place from which the vessel is navigated.

19.5 If the radio installation complies with Appendix B radio watch shall be maintained on the international distress, safety and calling frequency for the maritime mobile VHF radiotelephone service 156.80 MHz (Channel 16 as far as practicable).

#### 20. Tests

20.1 A radiotelephone operator shall test a radio installation once daily when at sea by communicating the vessel's position to a coast station or limited coast station and shall record the results in the log book referred to in paragraph 15.1.1.

### PART 4—TYPES OF RADIO INSTALLATIONS

#### Appendix A

—Single Sideband Radiotelephone Installations

#### Appendix B

—V.H.F. Frequency Modulated Radiotelephone Installations.

### APPENDIX A

#### SINGLE SIDEBAND RADIOTELEPHONE INSTALLATIONS

##### Division—1 Main Installation

#### 1. Specification

1.1 The equipment shall comply with the specification published by the Commonwealth Department of Communications for S.S.B. Radiotelephone equipment—RB 211B.

#### 2. Transmitter

2.1 The transmitter shall be capable of transmission on carrier frequencies using the types of emission listed below:

Frequencies	Type of Emission
2182 kHz	J3E
2162 kHz	
2638 kHz	
6215.5 kHz	

#### 3. Receiver

3.1 The receiver shall be capable of effective reception on the carrier frequencies using the types of emission listed below:

Frequencies	Type of Emission
2182 kHz	J3E
2162 kHz	
2638 kHz	
6215.5 kHz	

the receiver may provide for reception of such other frequencies as are appropriate to the service in which the vessel is engaged.

#### DIVISION 2—SOURCES OF ELECTRICAL ENERGY

#### 4. Main Source

4.1 There shall be a source of electrical energy capable of operating the main radiotelephone installation in the vessel.

4.2 When the main source of electrical energy meets the requirements of the reserve source, as specified in the following items, the main and reserve sources of energy may be combined.

#### 5. Reserve Source

5.1 The reserve source of electrical energy shall be of such capacity and be so maintained at all times while the vessel is at sea as to be able to supply continuously for a period of six hours a total current equal to the sum of:

5.1.1 one half of the current required to operate the single sideband radiotelephone transmitter for the transmission of speech;

5.1.2 the current required to operate the radiotelephone single sideband receiver; and

5.1.3 the current consumed by the electrical lamp referred to in paragraph 16.1.3 of Part 4 of this Section.

## 6. Batteries

6.1 Batteries provided as a source of any part of the electrical energy for the radiotelephone shall in no case be of the dry type.

6.2 Batteries shall be placed and housed to the satisfaction of the Posts and Telecommunications Department.

6.3 If the supply of electrical energy is derived wholly or in part from a battery or set of batteries means shall be provided on the vessel for charging the batteries, and preventing discharge of the battery or set of batteries other than by equipment listed in sub-item 5.1 above.

6.4 Each battery shall be capable of being fully charged by the means referred to in sub-item 6.3 within a period of 16 hours.

6.5 Means shall be provided for testing the charge condition of the batteries.

6.6 If the batteries provided are not solely for the use of the single sideband radiotelephone installation means shall be provided at the installation for readily isolating all other loads in an emergency and the battery, as well as being capable of meeting the requirements set forth in sub-item 5.1 shall be capable of sustaining all other loads to which it is connected for such time as required by the Posts and Telecommunications Department.

6.7 Where, in the opinion of the Posts and Telecommunications Department electrical generating devices in the vessel may cause damage to radio equipment through voltage fluctuations, the source of energy shall consist of two banks of batteries situated in or adjacent to the wheelhouse. The means of charging and discharging the batteries shall be through an interlocking isolating switch, which separates the battery on charge from the transmitter and combined or separated receiver.

## 7. General

7.1 The master of a radiotelephone vessel shall cause a sufficient supply of electrical energy to be available for testing the radiotelephone installation on the vessel at all reasonable times whilst in port.

### Division 3—Radiation System

## 8. Aerial

8.1 The aerial of the radiating system shall be of such type and dimensions and be so erected and insulated as to secure efficient radiation.

8.2 The aerial shall be so placed and constructed that it:

8.2.1 is adequately protected from mechanical damage;

8.2.2 precludes danger to personnel as a result of accidental contact;

8.2.3 does not interfere with the safe navigation or working of the vessel; and

8.2.4 is adequately protected from the adverse effect of salt water.

## 9. Earth

9.1 An efficient radio frequency earth together with a suitable connection to the radiotelephone installation shall be provided and fitted as considered necessary by the Posts and Telecommunications Department.

### APPENDIX B

## V.H.F. FREQUENCY MODULATED RADIOTELEPHONE INSTALLATIONS

### Division 1—Main Installation

#### 1. Specification

1.1 The equipment shall comply with the specification published by the Department of Communications for VHF FM Radiotelephone equipment—RB 274.

#### 2. Transmitter and Receiver

2.1 All equipment shall be capable of transmitting and receiving on the international distress, safety and calling frequency for the maritime mobile V.H.F./radiotelephone service 156.80 MHz.

2.2 All equipment shall also be capable of transmitting and receiving on channel 6, channel 12 and channel 20 and on such other frequencies as are appropriate to the service in which the vessel is engaged.

2.3 The maximum radio frequency output power of the transmitter must be not less than 7.5 watts and not more than 25 watts mean power. The transmitter for new or replacement equipment must include provision for readily reducing the output to not more than 1 watt mean power.

### Division 2—Sources of Electrical Energy

#### 3. Main Source

3.1 There shall be a source of electrical energy capable of operating the main radiotelephone installation in the vessel.

3.2 When the main source of electrical energy meets the requirements of the reserve source, as specified in the following items, the main and reserve sources of energy may be combined.

#### 4. Reserve Source

4.1 The reserve source of electrical energy shall be of such capacity and be so maintained at all times while the vessel is at sea as to be able to supply continuously for a period of six hours a total current equal to the sum of:

4.1.1 one half of the current required to operate the V.H.F. radiotelephone transmitter for the transmission of speech;

4.1.2 the current required to operate the V.H.F. radiotelephone receiver; and

4.1.3 the current consumed by the electric light referred to in paragraph 16.1.3 of Part 4 of this Section.

## 5. Batteries

5.1 Batteries provided as a source of any part of the electrical energy for the radiotelephone installation shall in no case be of the dry type.

5.2 Batteries shall be placed and housed to the satisfaction of the Posts and Telecommunications Department.

5.3 If the supply of electrical energy is derived wholly or in part from a battery or set of batteries means shall be provided on the vessel for charging the batteries, and preventing discharge of the battery or set of batteries other than by equipment listed in sub-item 4.1 above.

5.4 Each battery shall be capable of being fully charged by the means referred to in sub-item 5.3 within a period of 16 hours.

5.5 Means shall be provided for testing the charge condition of the batteries.

5.6 If the batteries provided are not solely for the use of the VHF radiotelephone installation means shall be provided at the installation for readily isolating all other loads in an emergency and the battery, as well as being capable of meeting the requirements set forth in sub-item 4.1 shall be capable of sustaining all other loads to which it is connected for such time as required by the Posts and Telecommunications Department.

5.7 Where, in the opinion of the Posts and Telecommunications Department, electrical generating devices in the vessel may cause damage to radio equipment through voltage fluctuations, the source of energy shall consist of two banks of batteries situated in or adjacent to the wheelhouse. The means of charging and discharging the batteries shall be through an interlocking isolating switch, which separates the battery on charge from the transmitter and combined or separate receiver.

## 6. General

6.1 The master of a vessel carrying a VHF radiotelephone shall cause a sufficient supply of electrical energy to be available for testing the VHF radiotelephone installation on the vessel at all reasonable whilst in port.

### Division 3—Radiation System

## 7. Aerial

7.1 The aerial of the radiating system shall be of such type and dimensions and be so erected and insulated as to secure efficient radiation.

7.2 The aerial shall be so placed and constructed that it:

7.2.1 is adequately protected from mechanical damage;

7.2.2 precludes danger to personnel as a result of accidental contact;

7.2.3 does not interfere with the safe navigation or working of the vessel; and

7.2.4 is adequately protected from the adverse effects of salt water.

7.3 The aerial installation shall be of vertical polarization.

7.4 The product of the antenna gain (with reference to an isotropic radiator) and the power of the transmitter measured at the point of connection to the aerial terminal shall not exceed 41 watts Effective Isotropic Radiated Power.

## MISCELLANEOUS EQUIPMENT

### CONTENTS

1. This Section is divided into Parts as follows:

PART 1	PRELIMINARY (CLAUSES 2-4)
PART 2	GENERAL PROVISIONS (CLAUSE 5)
PART 3	SCALES OF MISCELLANEOUS EQUIPMENT
PART 4	TYPES OF MISCELLANEOUS EQUIPMENT (APPENDICES A-M)

### PART 1—PRELIMINARY

2. This Section should be read in conjunction with the Introduction, Definitions and General Requirements Section.

3. The term "Miscellaneous Equipment" includes any item of equipment which may be required for safety of navigation or safety of crew, passengers or any other person on board for legitimate purposes, in port or at sea and which item of equipment is not required to be provided by any other Section of the recommended uniform requirements.

4. All items of miscellaneous equipment listed in Part 3 must conform to the standards detailed in the Appendices to the Section.

### PART 2—GENERAL PROVISIONS

5. Navigation Lights, Shapes and Sound Signals.

5.1 "Navigation Lights" means steaming lights, anchor lights, and not-under-command lights.

5.2 "Steaming Lights" means those lights to be shown by vessels when under way, including the optional manoeuvring light, and special purpose lights.

5.3 "Special Purpose Lights" means those lights required to be shown according to the types of operations of vessels (i.e. towing, fishing, pilotage and operations restricting vessels in their ability to manoeuvre) and those lights required to be shown by vessels constrained by their draughts.

5.4 All vessels shall be provided with at least a full set of such navigation lights, shapes and sound signal appliances as are required according to type, size and special purpose to ensure compliance with the Collision Convention.

5.5 Specifications—The requirements for performance capabilities and for the positioning of navigation lights, shapes and sound signals shall be in accordance with the provisions in the Annexes to the Collision Convention.

5.6 Spares—All vessels shall be provided with such number of spare lanterns and/or replacement parts for navigation lights as are deemed necessary by the Fiji Marine Board.

5.7 Main and Emergency Installation for Navigation Lights.

5.7.1 All vessels of Class 1, Class 2, Class 3A and 3B shall be provided with:

(a) A set of steaming lights capable of operating from main and emergency electrical installations; or

(b) A set of steaming lights capable of operating from a main electrical installation and a "stand-by" set of Steaming Lights operating from a separate and independent power source; and

(c) Anchor and N.U.C. lights capable of operating from a main electrical installation, and "stand-by" battery powdered or oil anchor and N.U.C. lanterns.

5.7.2 All Harbours, Rivers, Short Coasting and Sea Going Service vessels of Classes 3C, 3D and 3E shall:

- (a) be provided with a set of Steaming Lights capable of operating from an electrical installation;
- (b) be able to display Anchor and N.U.C. Lights; and
- (c) be provided with such emergency arrangements for the display of Steaming Lights as determined by the Fiji Marine Board.

5.8 Attention is drawn to the following extracts from the International Regulations for Preventing Collisions at Sea:

Rule 1: (b) Nothing in these Rules shall interfere with the operation of special rules made by an appropriate authority for roadsteads, harbours, rivers, lakes or inland waterways connected with the high seas and navigable by sea-going vessels. Such special rules shall conform as closely as possible to these Rules.

(e) Whenever the Government concerned shall have determined that a vessel of special construction or purpose cannot comply fully with the provisions of any of these Rules with respect to the number, position, range or arc of visibility of lights or shapes, as well as to the disposition and characteristics of sound-signalling appliances, without interfering with the special function of the vessel, such vessel shall comply with such other provisions in regard to the number, position, range or arc of visibility of lights or shapes, as well as to the disposition and characteristics of sound-signalling appliances, as her Government shall have determined to be the closest possible compliance with these Rules in respect to that vessel.

PART 3—SCALES OF MISCELLANEOUS EQUIPMENT

CLASS 1 AND 2—VESSELS ON INTERNATIONAL VOYAGES

Note: The following scales apply to vessels other than Safety Convention Vessels.

Measured Length	Requirements
All lengths	Chronometer or Deck Watch.
All lengths	Binoculars.
All lengths	Barometer or Barograph.
All lengths	Compasses: 1. (a) A Magnetic compass for use as a standard compass; (b) A Magnetic compass for use as a steering compass in the normal steering position; and (c) If an alternative steering position is provided, a magnetic compass at that alternative steering position.

Measured Length

Requirements

Vessels less than 60 metres	2. A steering magnetic compass in pursuance of 1 (b) is not required to be provided if: (a) the standard compass is a reflector or projector type which can be read at the steering position; (b) a gyro compass or repeater is provided the card of which can be read at the normal steering position; and (c) another compass is provided which is interchangeable with the standard compass provided in pursuance of 1 (a).  If the Fiji Marine Board is satisfied that it is unnecessary to provide more than one magnetic compass, a vessel may be exempted from the requirement to carry more than one compass.
All lengths	Hand lead line.
All lengths	Daylight signalling lamp.
All lengths	1 set of "International Code Flags".
All lengths	1 copy of "International Code of Signals".
All lengths	Official Log Book.
All lengths	Charts and Nautical publications suitable for the trade of the vessel.
All lengths	A Sextant.
60 metres and over	Accommodation ladder located on each side of the vessel.
Less than 60 metres	Either: (a) Accommodation ladder fitted on each side of the vessel; or (b) A gangway capable of being used on either of the vessel; or (c) A safe means of access approved by the Fiji Marine Board.
All lengths	A safety net if an accommodation ladder or gangway is carried on board.
All lengths	An echo-sounding device.
All lengths	A radar installation.
All lengths	A Sattelite Navigation or other electronic position indicating device.
All lengths	Such other electronic navigational aids as considered necessary by the Fiji Marine Board.
All lengths	Windlass, anchors and cables-sufficient in number, weight and strength, approved by the Fiji Marine Board or a Classification Society on its behalf.

Measured Length	Requirements
All lengths	Hawsers and warps of sufficient number, weight and strength having regard to the size and service of the vessel.
All lengths	Pilot ladder in accordance with Appendix I.
All lengths	Navigational lights, shapes and sound-signals to comply with provisions of the Collision Convention.
All lengths	Medicines and medical stores in accordance with Section K.
All lengths	Means for vocal communication between bridge and engine room.

### CLASS 3A—VESSELS IN THE RESTRICTED PACIFIC TRADE

(Restricted to operations of vessels between ROTUMA and any other Port or Place in Fiji)

Measured Length	Requirements
All lengths	Chronometer or Deck Watch.
All lengths	Binoculars.
All lengths	Barometer or Barograph.
All lengths	Compasses: <ol style="list-style-type: none"> <li>1. (a) A Magnetic compass for use as a standard compass;</li> <li>(b) A Magnetic compass for use as a steering compass in the normal steering position; and</li> <li>(c) If an alternative steering position is provided, a magnetic compass at that alternative steering position.</li> <li>2. A steering magnetic compass in pursuance of 1 (b) is not required to be provided if:               <ol style="list-style-type: none"> <li>(a) the standard compass is a reflector or projector type which can be read at the steering position;</li> <li>(b) a gyro compass or repeater is provided the card of which can be read at the normal steering position; and</li> <li>(c) another compass is provided which is interchangeable with the standard compass provided in pursuance of 1 (a).</li> </ol> </li> </ol>
Vessels less than 60 metres	If the Fiji Marine Board is satisfied that it is unnecessary to provide more than one magnetic compass, a vessel may be exempted from the requirement to carry more than one compass.

Measured Length	Requirements
All lengths	Hand lead line.
All lengths	Daylight signalling lamp.
All lengths	1 set of "International Code Flags".
All lengths	1 copy of "International Code of Signals".
All lengths	Charts and Nautical publications suitable for the vessel's area of operation.
All lengths	A sextant.
60 metres and over	Accommodation ladder fitted on one side of the vessel.
Less than 60 metres	Either: <ol style="list-style-type: none"> <li>(a) Accommodation ladder fitted on one side of the vessel; or</li> <li>(b) A gangway capable of being used on either side; or</li> <li>(c) A safe means of access approved by the Fiji Marine Board.</li> </ol>
All lengths	A safety net if an accommodation ladder or gangway is carried on board.
All lengths	An echo-sounding device.
All lengths	A radar installation.
All lengths	Such other electronic navigational aids as considered necessary by the Fiji Marine Board.
All lengths	Windlass, anchors and cables-sufficient in number, weight and strength, approved by the Fiji Marine Board or a Classification Society on its behalf.
All lengths	Hawsers and warps of sufficient number, weight and strength having regard to the size and service of the vessel.
All lengths	Pilot ladder in accordance with Appendix I.
All lengths	Navigational lights, shapes and sound-signals to comply with the provisions of the Collision Convention.
All lengths	Medicines and medical stores in accordance with Section K.
All lengths	Means for vocal communication between bridge and engine room.

CLASSES 3B AND 3C—VESSELS ENGAGED IN THE FIJI  
ISLANDS TRADE AND SEA-GOING SERVICE

Measured Length	Requirements
All lengths	Clock.
All lengths	Binoculars.
All lengths	Barometer or Barograph.
All lengths	Magnetic Compass: 1. A compass placed in a suitable position for taking accurate observations, and 2. A compass placed at the normal steering position. Note: Only one compass need be provided if the Fiji Marine Board is satisfied that one compass is adequate for both steering and taking accurate observations.
All lengths	Hand lead line.
All lengths	Signalling light.
Less than 30 metres	A torch with some spare batteries and bulbs.
All lengths	Flags B.C. and N.
All lengths	Charts and Nautical publications suitable for the vessel's area of operation.
All lengths	Gangway capable of being used on either side of the vessel or a safe means of access.
All lengths	Windlass, anchors and cables-sufficient in number, weight and strength, approved by the Fiji Marine Board or a Classification Society on its behalf.
All lengths	Hawsers and warps of sufficient number, weight and strength having regard to the size and service of the vessel.
All lengths	Navigational lights, shapes and sound-signals to comply with the provisions of the Collision Convention.
All lengths	Medicines and medical stores in accordance with Section K.
All lengths	Official Log Book.
All lengths	Means for vocal communication between bridge and engine room.

CLASS 3D—VESSELS ENGAGED IN THE SHORT COASTING SERVICE

Measured Length	Requirements
All lengths	A clock.
All lengths	Binoculars.
All lengths	A compass placed at the normal steering position.
All lengths	Echo-sounding device or a Hand lead line.
All lengths	Signalling light or torch.
All lengths	Flags N.C.
All lengths	Charts and Nautical publications suitable for vessel's area of operation.
All lengths	A safe means of access approved by the Fiji Marine Board.
All lengths	Windlass, anchors and cables-sufficient in number, weight and strength having regard to the size and service of the vessel.
All lengths	Navigation lights, shapes and sound-signals to comply with the provisions of the Collision Convention.
All lengths	Medicines and medical stores in accordance with Section K.
All lengths	Official Log Book; or Vessel Record Book.
All lengths	Means for vocal communication between bridge and engine room.

CLASS 3E—VESSELS ENGAGED IN THE HARBOUR AND  
RIVER SERVICE

Measured Length	Requirements
All lengths	Compass.
All lengths	A torch.
All lengths	Charts suitable for the vessel's area of operation and the current Fiji Nautical Almanac.
All lengths	Gangway or a safe means of access approved by the Fiji Marine Board.
All lengths	Windlass, anchors and cables—sufficient in number, weight and strength, approved by the Fiji Marine Board or a Classification Society on its behalf.
All lengths	Hawsers and warps of sufficient number, weight and strength having regard to the size and service of the vessel.

Measured Length	Requirements
All lengths	Navigation lights, shapes and sound-signals to comply with the provisions of the Collision Convention.
All lengths	Medicines and medical stores in accordance with Section K.
All lengths	Means for vocal communication between bridge and engine room.

## PART 4

## TYPES OF MISCELLANEOUS EQUIPMENT

Appendix	Title	Page
A	Chronometers and Deck Watches .....	
B	Compass .....	
C	Depth Sounding Equipment .....	
D	Signalling Equipment .....	
E	Charts and Nautical Publications .....	
F	Requirements for and use of Accommodation Ladders, Gangways and Safety Nets .....	
G	Electronic Navigational Aids .....	
H	Anchors and Cables .....	
I	Pilot Ladders and their use .....	
J	Mechanical Pilot Hoist .....	
K	Medicine and Medical Stores .....	
L	Official Log Book .....	
M	Electric Navigation Lights .....	

## Appendix A

## CHRONOMETERS AND DECK WATCHES

Chronometer or deck watch—shall mean a certified chronometer or deck watch capable of being rated and used in conjunction with radio time signals to provide an accurate time piece for navigation.

## Appendix B

## COMPASS

The term "Compass" shall include a gyro compass or a mechanical compass, and shall be of a type approved by the Fiji Marine Board.

## PART 1—REQUIREMENTS FOR MAGNETIC COMPASSES

## 1. Vessels Class 1, 2 &amp; 3A

1.1 In approving, certifying and positioning a magnetic compass for use on a Class 1, 2 or 3A Vessel the requirements of the following international standards, or their equivalent standards, shall be used for guidance.

1.1.1 ISO 449—"Magnetic Compasses and Binnacles—vessel's Class 1, 2 & 3A"

ISO R694—"Positioning of Compasses in Ships"

ISO 1069—"Magnetic Compasses and Binnacles—Vocabulary"

ISO 2269—"Magnetic Compasses and Accessories—Rules for Testing Certification"

IMO Resolution A382X.

## 2. Vessels Class 3B

2.1 In approving, certifying and positioning a magnetic compass for use on a Class 3B Vessel the requirements of the following international standards, or their equivalent national standards, shall be used for guidance:

2.1.1 ISO R613—"Magnetic Compasses and Binnacles—Class"

ISO R694—"Positioning of Compasses in Ships"

ISO 1069—"Magnetic Compasses and Binnacles—Vocabulary"

ISO 2269—"Magnetic Compasses and Accessories—Rules for Testing and Certification"

IMO Resolution A382X.

## 3. Vessels Class 3C, 3D &amp; 3E

3.1 A magnetic steering compass shall:

3.1.1 be located so that the view of the horizon from the compass position shall be as uninterrupted as possible for a minimum arc of 115 degrees from right ahead on either side of the vessel;

3.1.2 be located forward of the steering wheel/controls in such a manner that it can be easily read from the normal steering position;

3.1.3 be fitted with an efficient means of illumination together with a device for dimming the illuminations;

3.1.4 be suspended by gimbals so that the bowl shall remain horizontal when the binnacle is tilted 40 degrees in any direction;

3.1.5 be located in such a position as to permit proper adjustment; and

3.1.6 be provided with a compass card and according to the following table:

of Compass	Length of vessel (m)	Diameter
	Card (mm)	
	Less than 10	75
	10 up to less than 20	100
	20 and over	125

#### 4. General Requirements

4.1 Where a projector and/or reflector or transmitting type of standard compass is the only magnetic compass fitted on board it shall:

4.1.1 be capable of being used as a normal magnetic compass in the event of a power failure; or

4.1.3. be provided with an emergency electrical supply capable of operating the installation for a period of not less than 24 hours.

4.2 General arrangement plans submitted to the Fiji Marine Board in respect of new vessels are to include details of:

4.2.1 all items of equipment or magnetic materials likely to exert a disturbing influence on the compass; and

4.2.2 all items which will impair the visibility of the horizontal from a compass position.

#### 5. Other Equipment in Vicinity of Compasses

5.1 When electrical instruments are located close to a magnetic compass, care should be taken to ensure that the compass is not affected whether the equipment is energised or not. Electrical equipment should not be placed nearer to any magnetic compass than the "safe distance" which has been determined by test or recommended by the manufacturer of such equipment.

5.2 Portable electrical equipment such as hand microphones and telephone hand sets can seriously affect magnetic compasses and should not be operated when held close to a compass.

5.3 When electrical equipment is fitted nearer to a magnetic compass than the recommended safe distance, or if no safe distance is known in respect of a unit, compass deviations should be checked with the equipment in operating and non-operating modes to ensure that the compass is properly compensated and not affected by the equipment. Where such equipment is removed, modified or replaced, or major adjustment/maintenance is made, the compass deviations shall be checked to ensure that no change has taken place.

5.4 The minimum distance at which a magnetic compass should be placed from magnetic materials is indicated in IMO Resolution 382X.

Any magnetic material in the vicinity of the compass should be disposed symmetrically about the compass and outside the minimum distance. Where magnetic material disposed outside the minimum distance still causes the compass not to operate satisfactorily, the distance of the material away from the compass should be increased.

5.5 Where the structure of the vessel does not allow magnetic materials to be placed at the required minimum distance, the compass should be sited in the best position compatible with these requirements and the owner or master of the vessel should produce subsequent evidence of satisfactory performance in service.

#### 6. Adjustment of Magnetic Compasses on vessels of Classes A, B, and C

6.1 Before an initial certificate of survey is issued in respect of a vessel to which this item applies, the compass or compasses of that vessel shall be adjusted by an adjuster of compasses. Thereafter vessels to which this item applies shall have their compasses adjusted by an adjuster of compasses at intervals not exceeding 2 years.

6.2 Provided that where the Fiji Marine Board is satisfied that a compass adjustment is not required or that an adjustment may be deferred without detriment to the safety of the vessel, the Fiji Marine Board may exempt the vessel from compass adjustment for such period as the Fiji Marine Board may determine.

6.3 The compass or compasses of a vessel shall be adjusted in any of the following cases:

6.3.1 if the vessel has undergone repairs or alterations of such a nature as is in the opinion of the Fiji Marine Board likely to affect the accuracy of the compass or compasses;

6.3.2 if the vessels has not previously operated from any port or place in Fiji; and

6.3.3 if the compass or compasses of the vessel are, in the opinion of the Fiji Marine Board, unsatisfactory or unreliable.

6.4 An "adjuster of compasses" shall be an adjuster of compasses so approved by the Fiji Marine Board.

### PART II—REQUIREMENTS FOR GYRO COMPASSES

#### 1. Introduction

1.1 The gyro compass where fitted should determine the direction of the vessel's head in relation to Geographic (True) North.

1.2 The equipment should comply with the following minimum performance requirements.

#### 2. Definitions

For the purpose of this Section, the following definitions apply:

2.1 The term gyro compass comprises the complete equipment and includes all essential elements of the complete design.

2.2 The true heading is the horizontal angle between the vertical plane passing through the true meridian and the vertical plan passing through the vessel's fore and aft datum line. It is measured from True North (000 degrees) clockwise through 360 degrees.

2.3 The compass is said to be settled if any three readings taken at intervals of 30 minutes (when the compass is on a stationery base) are within a band of 0.7 degrees.

2.4 The settle point heading is the average value of three readings taken at 30 minutes intervals after the compass has settled.

2.5 The settle point error is the difference between settle point heading and true heading.

2.6 The errors to which the gyro compass is subject are considered to have a probability of 68.3 per cent, where the errors are taken as differences between the observed values and their mean value.

The maximum error is understood as triple the above error and has a probability of 99.7 per cent.



### 3. Method of Presentation

3.1 The compass card should be graduated in equal intervals of one degree or a fraction thereof. A numerical indication should be provided at least at every ten degrees, starting from 000 degrees clockwise through 360 degrees.

### 4. Illumination

4.1 Fully adequate illumination should be provided to enable reading of scales at all times. Facilities for dimming should be provided.

### 5. Accuracy

#### 5.1 Settling time of equipment.

5.1.1 The compass should settle within six hours of switching on in latitudes of up to 70 degrees.

5.2.1 The maximum value of the settle point error of the master compass should not exceed + 2 degrees in the general conditions mentioned in sub-item 6.1 and item 8 and including variations in magnetic field likely to be experienced in the vessel in which it is installed.

5.2.2 The maximum error of the master compass in latitudes up to 70 degrees should not exceed:

- (a) + 1 degree when the vessel is travelling on a straight course at a constant speed in conditions of calm sea;
- (b) + 2.5 degrees to a rapid alteration of course of 180 degrees at speeds up to 20 knots;
- (c) + 2 degrees due to a fast alteration of speed to 20 knots;
- (d) + 3 degrees when rolling and pitching with any period between 3 and 15 seconds, a maximum angle of 22.5 degrees and a maximum horizontal acceleration of 3 metres/seconds squared.

5.2.3 The maximum divergence in reading between the master compass and repeaters should not exceed + 0.3 degrees under the conditions mentioned in paragraph 5.2.1.

#### Notes:

When the compass is used for purposes other than steering and bearing, a higher accuracy might be necessary.

To ensure that the maximum error referred to in sub-paragraph 5.2.2 (d) is not exceeded in practice, it will be necessary to pay particular attention to the siting of the master compass.

### 6. Power Supply

6.1 The equipment should be capable of rating continuously in accordance with the requirements of this Section in the presence of such variations of the power supply as are normally expected in a vessel.

6.2 Means should be incorporated for the protection of the equipment from excessive currents and voltages, transients and accidental reversal of power supply polarity.

6.3 If provision is made for operating the equipment for more than one source of electrical energy, arrangements for rapidly changing from one source of supply to the other should be incorporated.

### 7. Interference

7.1 All steps should be taken to eliminate as far as practicable the causes of, and to suppress, electromagnetic interference between the gyro compass and other equipment on board.

7.2 Mechanical noise from all units should be so limited as not to prejudice the hearing of sounds on which the safety of the vessel might depend.

7.3 Each unit of the equipment should be marked with the minimum safe distance at which it may be mounted from a standard or a steering magnetic compass.

### 8. Durability and Resistance of Effects of Climate

8.1 The equipment should be capable of continuous operation under the conditions of vibration, humidity and change of temperature likely to be experienced in the vessel in which it is installed.

### 9. Construction and Installation

9.1 The master compass and any repeaters used for taking visual bearings should be installed in a vessel with their fore and aft datum lines parallel to the vessel's fore and aft datum line to within +0.5 degrees. The lubber line should be in the same vertical plane as the centre of the card of the compass and should be aligned accurately in the fore and aft direction.

9.2 Means should be provided for correcting the errors induced by speed and latitude.

9.3 An automatic alarm should be provided to indicate a major fault in the compass system.

9.4 The system should be designed to enable heading information to be provided to other navigational aids such as radar, radio direction finder and automatic pilot.

9.5 Information should be provided to enable competent members of a vessel's staff to operate and maintain the equipment efficiently.

9.6 The equipment should be provided with an indication of manufacture, type and/or number.

9.7 The equipment should be so constructed and installed that it is readily accessible for maintenance purposes.

## DEPTH SOUNDING EQUIPMENT

## 1. Mechanical depth sounding device

1.1 Mechanical depth sounding devices shall include echo-sounders, deep sea sounding machines, or any other apparatus designed for determining the depth of water using mechanical, hydrostatic pressure or electronic means.

1.2 A mechanical depth sounding device shall be complete with such accessories and spare parts as are sufficient, in the opinion of the Fiji Marine Board, having regard to the type of device.

## 2. Hand lead shall consist of

2.1 A lead weighing at least 3 kg

2.2 A line of at least 46 metres, correctly marked.

## Appendix D

## SIGNALLING EQUIPMENT

## 1. Daylight Signalling Lamp

1.1 Shall be of a type approved by the Fiji Marine Board.

1.2 Shall not be solely dependent upon the vessel's main source of power.

## 2. Signalling Lamp or Light

2.1 Shall be a signal light approved by the Fiji Marine Board;

2.2 may be portable or fixed;

2.3 includes torch or similar apparatus;

2.4 shall have a source of power independent of vessel's main power supply.

3. "International Code of Signals" means any published manual approved by the Fiji Marine Board containing the International Code Signals adopted by I.M.C.O. in 1965 and as amended from time to time.

## Appendix E

## CHARTS AND NAUTICAL PUBLICATIONS

These may consist of:

Nautical Almanac  
Nautical Tables  
Sailing Directions  
Charts

Charts issued specifically for use with electronic position finding aids

List of Lights

Tide Tables

List of Radio Signals and Radio Stations

Merchant Ships Search and Rescue Manual

Chart Instruments

REQUIREMENTS FOR AND USE OF ACCOMMODATION LADDERS,  
GANGWAYS AND SAFETY NETS

1. Accommodation Ladder shall be a sloping ladder fitted with a series of steps of treads and handrails, used to provide safe access to and from a vessel.

## 2. Accommodation Ladders

Vessel's accommodation ladders shall:

2.1 be at least 550 mm wide (clear width of step or tread);

2.2 be provided with platform as necessary;

2.3 be fitted on both sides throughout the whole length with railings; and

2.4 be so made that they can be adequately supported and secured by suitable fastenings against displacement or slipping.

Accommodation ladders should be so secured that when they are used in tidal ports they can be adjusted to the height of the wharf or other landing place according to the state of the tide.

## 3. Gangways

Gangways shall be a narrow platform or bridge fitted with handrails, used to provide safe access to and from a vessel.

## 3.1 Gangways shall:

3.1.1 be at least 550 mm wide (clear width of step or tread);

3.1.2 be fitted on both sides throughout the length with railings; and

3.1.3 be provided with transverse treads at suitable stepping intervals.

3.2 On gangways which pivot or swivel horizontally on a platform the meeting point (gangway-platform-steps) should be adequately protected by railings or ropes.

3.3 The wheels or roller at the bottom of the gangway shall have a guard to protect persons feet if the vessel moves.

## 4. Railings

## 4.1 All railings shall:

4.1.1 be of sound material and good construction and possess adequate strength;

4.1.2 be at least 900 mm high measured at right angles to the line joining the top edge of the steps or trends; and

4.1.3 consist of two rails, taut ropes or chains supported by stanchions, and, if necessary, a toe-board, to prevent persons slipping or objects falling

4.2 Intermediate rails, ropes or chains should be not more than 500 mm apart.

## 5. Use of Accommodation Ladders, Gangways and Safety Nets

5.1 Every accommodation ladder and gangway shall be:

5.1.1 maintained in a safe and good condition;

5.1.2 secured to prevent shifting and slipping; and  
 5.1.3 suitably rigged and maintained to compensate for movement of the ship.

5.2 Where a platform is provided at the bottom of a ladder or gangway, the platform shall be level and horizontal.

5.3 Safety nets shall be used with accommodation ladders and gangways as follows:

5.3.1 Where an accommodation ladder is suspended in tackles and resting against the side of the vessel a safety net shall be positioned under the lower end of the ladder.

5.3.2 Where the bottom of an accommodation ladder or gangway extends over the wharf and persons boarding or leaving the vessel are protected by handrails on both sides throughout the entire length, a safety net shall not be required.

5.3.3. The sides of an accommodation ladder or gangway shall be of sufficient height and fitted with screens or netting.

## 6. Safety Nets

A safety net shall be approximately 5.5 metres by 2.5 metres in size, with mesh size of approximately 100 mm, and made of rope of not less than 12 mm diameter, being coir, or other cordage of equivalent strength, or shall be such dimensions and material as required by the Fiji Marine Board for particular sizes of vessels. Sufficient ropes of adequate length shall be attached for positioning of the net.

### Appendix G

#### ELECTRONIC NAVIGATIONAL AIDS

The term "Electronic Navigational Aids" includes:

Radar  
 Decca  
 Direction Finder  
 Sattelite Navigator

### Appendix H

#### ANCHORS AND CABLES

##### 1. Requirements

1.1 For vessels of measured length of not more than 25 metres.

1.1.1 For vessels of measured length of not more than 25 metres and having a displacement hull the number and weight of anchors shall be as specified in Table 1.

1.1.2 For vessels of measured length of not more than 25 metres and having a planning hull, the weight of anchors shall be 75 per cent of the weights in Table 1. The number of anchors shall be determined by the placing in Table 1 of weights equivalent to the reduced weights for these vessels.

1.1.3 The type, size and length of anchor cable shall be as specified in Tables 2, and 3 according to the weight of anchor and length of vessel respectively.

1.1.4 The notes of Tables 1 and 2 shall be consulted for allowable variations from the numbers, weights, sizes, etc., specified.

1.2 For vessels of measured length of 25 metres and over but not more than 61 metres, the appropriate anchors and cables may be in accordance with Table 4, and regulated by the Equipment Number obtained from the equation.:

$$EN = \Delta^{2/3} + 2(Ba + \sum bh) + 0.1A$$

Where

EN = Equipment Number

$\Delta$  = moulded displacement in tonnes to the designed load waterline;

B = moulded breadth in metres;

a = freeboard in metres from the designed load waterline to the weather deck;

b = breadth in metres of a tier of deckhouse etc., where breadth greater than B/4

h = height in metres of a tier of deckhouse etc., where breadth greater than B/4;

H = a + h1 + h2 + ...

A = the profile area in square metre of the hull and those superstructures and houses where breadth greater than B/4. Screens and bulwarks more than 15 metres in height are to be regarded as part of this area.

1.3 For vessels of measured length of 61 metres and over appropriate anchors and cables shall be in accordance with Classification Society Tables, and regulated by the Equipment Number obtained from the formula:

$$EN = \Delta^{2/3} + 2BH + 0.1A$$

1.4 Departures from required anchors and cables

1.4.1 Where the Fiji Marine Board decides, on the basis of special features, size, activities or area of operations, that the tabulated weights etc. for a vessel of less than 25 metres measured length are not the most appropriate for that vessel, the Fiji Marine Board may calculate the anchor weight etc. by use of formula:

$$EN = \Delta^{2/3} + 2(Ba + \sum bh) + 0.1A$$

and by use of Table 4, and may then require anchors or cables which differ from those tabulated.

1.4.2 Similarly the Fiji Marine Board in special circumstances as above, may modify or exempt a vessels' compliance with the above requirements.

##### 2. Testing of Anchors

2.1 Anchors of more than 75 kg are tested by Classification Society and are certified by them for "classed" vessels.

Such testing includes

— proof load;  
 report of heat treatment;  
 metallurgy analysis.

2.2 Anchors of less than 75 kg are normally only proof tested, or only a random selection or sample proof tested. Many small boat anchors are produced by small scale manufacturers, with no particular regard for heat treatment or correct metallurgy.

2.3 It is required that the Fiji Marine Board should be satisfied concerning the design, weight, quality and efficiency of anchors which are permitted to be carried by vessels under their jurisdiction.

3. Testing of Anchors Cables

3.1 Manufacturers of chain and of natural or synthetic fibre ropes may be required to issue certificates of test which each chain or rope produced. Manufacture shall be to Australia or U.K. Standards or equivalent.

3.2 It shall be a general principle that the chain or rope is of sufficient strength to match the maximum holding power of a specified weight and type of anchor.

4. Windlass

4.1 Where the weight of anchor is less than 30 kg and where fibre rope is used in lieu of anchor chain, as per Table 2, a mechanical lifting device need not be fitted. The inboard end of the rope should be permanently made fast to the vessel.

4.2 In all other cases a windlass or capstan shall be provided. For an anchor the weight of which is 30 kg and over but less than 50 kg the windlass or capstan may be hand operated, and for anchor weights of 50 kg and over the windlass or capstan must be power operated. The windlass or capstan shall be of suitable size and lifting capacity for the anchor(s) and rope(s) carried by the vessel. Except that in smooth water vessels the need for a windlass may be left to the discretion of the Fiji Marine Board.

4.3 Such windlasses or cable winches or other suitable lifting devices, shall be securely fitted to the deck of the vessel.

4.4 The Fiji Marine Board shall satisfy itself that the arrangements for lowering and hoisting anchors and for securing the chain or rope when a vessel is at anchor are satisfactory for the size and type of vessel.

NOTES RE TABLE 1

1. High-Holding-Power Anchors

1.1 The weights given are for Admiralty Pattern Stockless anchors with an assumed holding power of 3 times their own weight.

1.3 See Notes re Table 2 for details of chains or ropes for high-holding-power anchors.

2. Variation in weight of anchors. Where a vessel is required to carry two anchors of a specified weight, any one anchor may differ by not more than 10 per cent from such specified weight but such that the total weight of both anchors carried shall not be less than twice the specified weight.

3. Distribution of weight in anchor. The weight of the head of a Stockless anchor shall be at least 60 per cent of the total weight of the anchor.

4. Performance of Anchors. Varies widely in different types of holding ground. Where a vessel will be operating for most of the time in an area of known-poor holding ground, the Fiji Marine Board may require to carry heavier/better equipment.

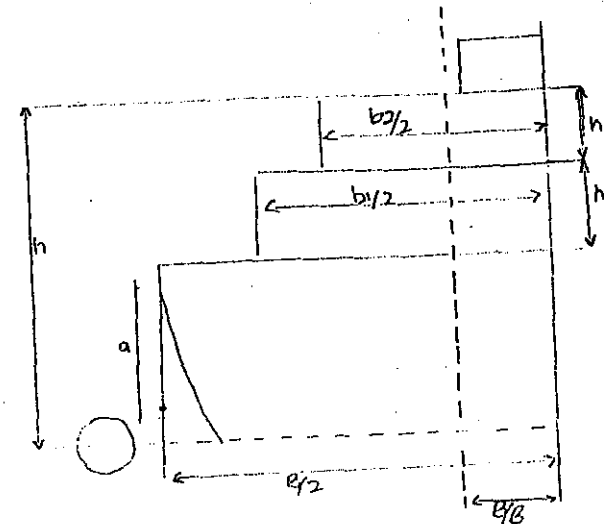


TABLE 1 (A)  
ANCHOR WEIGHTS (KG) FOR VESSELS CLASS 1, 2, 3A & 3B  
FIJI ISLANDS TRADE TO INTERNATIONAL

Hm	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
Lm														
3														
4			8	11										
5		8	12	13.5	16									
6	8	11	14	16	18.5	21								
7	10	13	16	18.5	21	24	26							
8	12	15	18.5	21	24.5	27	31	35						
9	14	17	21	24	28	32	36	41	46					
10	16	19	23.5	27	32	37	42	47	52	59				
11	18	22	26	31	37	42	48	54	61	67.5	75			
12	20	24.5	29	35	41	48	54	62	69.5	77	87	96		
13	22	27	33	40	46.5	53.5	62	70	80.5	90	99.5	110	121	
14	24	30.5	37.5	45	52	61	70	81	91	102	113	124.5	138	148

Hm	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
15	27	35	42	50	59	69	79	91	102	115	128	141	154	167.5
16	31	39	47	56	66	77	90	102	115	129	142	156	171	186
17	35	43	52	63	74	87	100	114	129	143	158	174	190	206
18	39	48	58	70	83	97	111	127	142	158	175	191	210	226
19	43	53	65	78	93	108	124	140	156	175	192	211	227.5	246
20	48	59	72	87.5	103	120	137	154	172.5	191	211	229	248	268
21	53	66	80	97	114	132	149	169	189	208	228	248	269.5	291
22	59	73	90	107	126	144.5	164	185	206	226	247	269.5	292	318
23	65	82	100	118	138	158	180	201	223	244	268	291	318	347
24	72	90	109	130	150	172	195	218	240	264	289	318	343.5	388
25	80	99	121	142	163	188	212	235	259	284	312	344	384	432

Above \_\_\_\_\_ 1 Anchor required      Below \_\_\_\_\_ 2 Anchors required

Hm — Height in metres  
Lm — Length in metres      (See diagram in item 4)

TABLE 1 (B)  
ANCHOR WEIGHTS (KG) FOR VESSELS CLASS 3C  
(SEAGOING SERVICE)

Hm	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
3														
4			7	10										
5		7	10	12	14									
6	7	10	12	13	15	18								
7	9	11	14	16	18	20	22.5							
8	10	12.5	15	17.5	20	22.5	25	30						
9	12	15	17.5	20	22.5	27.5	30	35	40					
10	14	17	20	22.5	27.5	30	35	40	45	50				
11	15	20	22.5	25	30	35	40	45	50	55	60			
12	17	20	25	30	35	40	45	50	57.5	65	72.5	80		
13	20	25	30	35	40	45	50	60	67.5	75	82.5	90	100	
14	20	25	32.5	37.5	45	50	57.5	67.5	75	85	95	105	115	125
15	22.5	30	35	42.5	50	57.5	65	75	85	95	110	120	130	140

Hm	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	
16	25	32.5	40	47.5	55	65	75	85	97.5	110	120	130	145	160	175
17	30	37.5	45	52.5	62.5	72.5	85	95	110	120	130	145	160	175	190
18	32.5	40	50	60	70	80	92.5	105	120	130	145	160	175	190	205
19	35	45	55	65	77.5	90	105	120	130	145	160	175	190	205	225
20	40	50	60	72.5	85	100	115	130	145	160	175	190	210	225	245
21	45	55	67.5	80	95	110	125	140	160	175	190	205	225	245	265
22	50	60	75	90	105	120	135	155	175	190	205	225	245	265	290
23	55	70	85	100	115	130	150	170	190	205	220	240	260	285	320
24	60	75	90	110	125	145	165	180	200	220	240	260	285	315	350
25	65	85	100	120	140	160	180	200	220	240	260	285	315	350	

Above \_\_\_\_\_ 1 Anchor required      Below \_\_\_\_\_ 2 Anchors required

Hm — Height in metres  
Lm — Length in metres      (See diagram in item 4)

TABLE 1 (C)  
ANCHOR WEIGHTS (KG) FOR VESSELS CLASS 3D  
(SHORT COASTING)

Hm	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
3														
4			6	8										
5		6	8	9.5	11									
6	6	8	9.5	11	12.5	14								
7	7	9	11	12.5	14.5	16	18							
8	8	10.5	12.5	14.5	16.5	18.5	21	23.5						
9	9.5	12	14	16.5	18.5	21.5	24.5	28	31					
10	11	13	16	18.5	21.5	25	28.5	32	35	40				
11	12.5	15	18	21	24.5	28.5	32.5	36	41	45.5	50			
12	13	16.5	20	23.5	28	32.5	36.5	42	46	52	58	64		
13	15	18.5	22.5	27	31.5	36	42	47	53	60	66	73	81.5	
14	17	20.5	25	30.5	35	41.5	47	53	60.5	68	74.5	84.5	92	99
15	19	23	29	33.5	40	46	53	60.5	68	77	86	94	103	112
16	21	26	32	37.5	44.5	51.5	59.5	68	77	87	95.5	104.5	114.5	125

Hm	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
17	23	30.5	35	42.5	49	58	66.5	76	87	95.5	105.5	116.5	117	138
18	26.5	32.5	39	47	55.5	64.5	74.5	85.5	96	105.5	117	128.5	140	151
19	29	36	44	52	62	72	83.5	96	106	117	129	141	153	164
20	32.5	40	48	58.5	68.5	81	92	104.5	115.5	128	141	153.5	166	180
21	35.5	44.5	53.5	64.5	76	88.5	100	113.5	126.5	138	153	166.5	181	195
22	40	49	60	71.5	85	96.5	111	124	138	152	165.5	181	195.5	211
23	44	54	66.5	79	93	106.5	120	135	149.5	163.5	180	195.5	211	230
24	48	60.5	73	88	100.5	116	131	146	162	175	196	210	229	250
25	53.5	66.5	81	95	111	126	142	156	174	190	207.5	227	249	272

Above \_\_\_\_\_ 1 Anchor required      Below \_\_\_\_\_ 2 Anchors required

Hm — Height in metres  
Lm — Length in metres } (See diagram in item 4)

TABLE 1 (D)  
ANCHOR WEIGHTS (KG) FOR VESSELS CLASS 3E  
(HARBOURS & RIVERS)

Hm	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
3														
4			4	5										
5		4	5	6	7									
6	4	5	6	7	8	9								
7	4.5	6	7	8	9.5	11	12							
8	5.5	6.5	8	9.5	11	12.5	14	15.5						
9	6	7.5	9	11	12.5	14.5	16	18.5	21					
10	7	8.5	11	12.5	14.5	16.5	19	21.5	24	26.5				
11	8	10	12	14.5	16	19	22	24.5	27.5	31	34.5			
12	9	11	14	15.5	18.5	22	25	28	31.5	35.5	39.5	43		
13	10	12.5	15	18	21.5	24.5	28	32	36	40.5	45	50	54.5	
14	11.5	14	17	20.5	24	27.5	32	36.5	41	46.5	51	56.3	62	67
15	12.5	15.5	19	23	27	31	36	41	46	52	57.5	63.5	69.5	75

Hm	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
16	14	17.5	21.5	25.5	30	35	40.5	46	52	58	64	70	76.5	83
17	15.5	19.5	24	28.5	34	39.5	45	51.5	58	64	71	77.5	85	92
18	17.5	22	26.5	32	38	43.5	50.5	57.5	64	71	78	86	93.5	101.5
19	19.5	24.5	29.5	35.5	41.5	49	56	63	70.5	78	86	94.5	103	111
20	22	27	33	39.5	46.5	54	62	70	77	85.5	94.5	103.5	112.5	121
21	24.5	30	36.5	43.5	51.5	59	67.5	75.5	84	94	103	112.5	122	132.5
22	27	33.5	40.5	47	57	65	73.5	82.5	92	102	112	122	133	144
23	29.5	37	45	53	62	71	80	90	100	110.5	121	132	144.5	157.5
24	33	40.5	49.5	58.5	68	77	87	98	108.5	119	131	143.5	157	171
25	36.5	45	54	64	73.5	84	95	106	117	129	142	156	170.5	186

Above \_\_\_\_\_ 1 Anchor required      Below \_\_\_\_\_ 2 Anchors required

Hm — Height in metres  
Lm — Length in metres } (See diagram in item 4)

Table 2(A)  
ANCHOR CABLES—VESSELS CLASSES 1, 2, 3A, 3B & 3C

	Anchor weight kg	Short link chain Diameter in mm	Manila Diameter in mm	Polypropylene Diameter in mm	Nylon Diameter in mm	+Chain Length
Rope may be used in lieu of chain	Under 8 8-13 13-18 18-25	8 8 8 8	14 16 18 20	12 12 14 16	10 10 11 12	3m chain of table size shackled between rope and anchor
One chain must be carried. Rope may be substituted for chain on second anchor	25-32 32-38 38-44 44-51 51-76 76-89 89-100	10 10 10 13 14 14 15	24 24 24 30 34 38 40	16 18 22 24 28 32 34	14 14 16 18 20 22 24	6m chain of table size shackled between rope and anchor
Rope not permitted	100-130 130-178 178-226 226-274 274-322 322-370 370-432	15 16 17 19 20 21 21				

Table 2(B)  
ANCHOR CABLES—VESSELS CLASS 3D

	Anchor weight kg	Short link chain Diameter in mm	Manila Diameter in mm	Polypropylene Diameter in mm	Nylon Diameter in mm	+Chain Length
Rope may be used in lieu of chain	Under 8	8	14	12	10	3m chain of table size shackled between rope and anchor 6m chain of table size shackled between rope and anchor
	8-13	8	16	12	10	
	13-18	8	18	14	11	
	18-25	8	20	16	12	
	25-38	10	24	18	14	
	38-44	12	24	22	16	
	44-51	13	28	24	18	
	51-89	14	36	30	22	
	89-100	15	40	34	24	
	One chain must be carried. Rope may be substituted for chain on second anchor	100-130	15	48	40	
130-178		16	52	46	34	
178-226		17	56	48	36	
226-274		19	60	52	38	

Table 2(C)  
ANCHOR CABLES—VESSELS CLASS 3E

	Anchor weight kg	Short link chain Diameter in mm	Manila Diameter in mm	Polypropylene Diameter in mm	Nylon Diameter in mm	+Chain Length
Rope may be used in lieu of chain	Under 8	8	14	12	10	3m chain of table size shackled between rope and anchor 6m chain of table size shackled between rope and anchor
	8-13	8	16	12	10	
	13-18	8	18	14	11	
	18-25	8	20	16	12	
	25-38	10	24	18	14	
	38-44	12	24	22	16	
	44-51	13	28	24	18	
	51-89	14	36	30	22	
	89-100	15	40	34	24	
	100-130	15	48	40	30	
One chain must be carried. Rope may be substituted for chain on the other anchor	130-178	15	52	46	34	9m chain of table size shackled between rope and anchor
	Over 178	16	56	48	36	

Notes re Table 2

1. Where a lighter weight high-holding-power anchor is permitted (see Note, Table 1), the chain or rope used shall be that nominated for the weight of the stockless anchor for which the high-holding-power is specified.

2. For small high-holding-power anchors, the use of nylon is recommended because of its greater elasticity and breaking strain compared to manila.

3. Where anchor ropes are permitted in lieu of chain, the use of a length of chain of tabulated size shackled between rope and anchor is mandatory. This chain facilitates the anchor shank in assuming a horizontal position, hence maximising the holding power of the anchor.

4. It should be noted that polypropylene ropes are subject to actinic degradation, and therefore, when not required for use, should be stowed out of the sunlight.

Table 3  
LENGTHS OF ANCHOR CABLE TO BE CARRIED

Length of vessel metres	Length of cable per anchor metres
3	45
4	45
5	55
6	55
7	55
8	55
9	55
10	55
11	55
12	70
13	70
14	70
15	82
16	82
17	82
18	96
19	96
20	96
21	110
22	110
23	110
24	110
25	110

Table 4

Equipment No.	Stockless anchors		Anchor chain	
	Number	Weight per anchor kg	Total length m	Diameter mm
5	1	20	110	8
10	2	32	110	10
15	2	42	140	10
20	2	52	140	12.5
25	2	64	164	12.5
30	2	75	164	12.5
40	2	100	192	12.5
50	2	120	192	12.5
60	2	140	220	14
70	2	160	220	14
80	2	180	220	16
90	2	210	220	16
100	2	240	220	16
110	2	270	247.5	17.5

Equipment No.	Stockless anchors		Anchor chain	
	Number	Weight per anchor	Total length	Diameter
120	2	300	247.5	17.5
130	2	340	275	19
140	2	390	275	20.5
150	2	480	275	22
175	2	570	302.5	24
205	2	660	302.5	26
240	2	780	330	28
280	2	900	357.5	30
320	2	1,020	357.5	32
360	2	1,140	385	34
400	2	1,290	385	36
450	2	1,440	412.5	38
500	2	1,590	412.5	40
550	2	1,740	440	42
600	2	1,920	440	44
660	2	2,100	440	46

**Note:**

For intermediate values of equipment number use equipment complement in sizes and weights given for the lower equipment number in the table. Length of anchor cable given in table is the total length of cable for the two anchors required.

## Appendix I PILOT LADDERS AND THEIR USE

1. The pilot ladder is to be efficient for the purpose of embarking pilots and must be kept clean and in good repair.

The ladder shall only be used by pilots and other persons on official business and not used for general purposes.

2. Provision is to be made to enable the pilot ladder to be rigged on either side of the vessel and it must be positioned and secured so that it is clear of any discharge and as far as practicable from the finer lines of the vessel so that each step rests firmly against the vessel's side, and so that the pilot may gain safe and convenient access to the vessel from the ladder after climbing not more than 9 metres.

The pilot ladder is to consist of one continuous length without joins, capable of reaching the waterline from the point where access to the vessel is provided for the pilot, under any conditions with respect to the loading and trim of the vessel and including an adverse list of 15 degrees.

3. Whenever the distance from the sea level to the point of access to the vessel is more than 9 metres from the pilot ladder to the vessel shall be by means of an accommodation ladder or other equally safe and convenient means. Such accommodation ladder shall be constructed, sited and secured so that the lower end rests firmly at all times against the side within the parallel body length of the vessel and clear of all discharges.

The pilot ladder is to be positioned against the side of the vessel and the lower platform of the accommodation ladder, to allow safe access between the pilot ladder and the accommodation ladder and so that the pilot ladder extends for a distance of at least two metres above the level of the lower platform and is secured at this point.

4. The rigging of the pilot ladder and the accommodation ladder or alternative means of passage onto or off the vessel, and the embarkation and disembarkation of a pilot or other persons using the equipment are to be supervised by a responsible officer.

5. The steps of the pilot ladder are to be:

5.1 of the hardwood, or other material of equivalent properties, made in one piece free of knots, having an efficient non-slip surface, the four lowest steps may be made of rubber of sufficient strength and stiffness or of other suitable material of equivalent characteristics;

5.2 not less than 480 millimetres long, 115 millimetres wide and 25 millimetres in depth, excluding any non-slip device;

5.3 equally spaced not less than 300 millimetres nor more than 380 millimetres apart and secured in such a manner that they will remain horizontal.

6. No pilot ladder may have more than two replacement steps which are secured in position by a method different from that used in the original construction of the ladder and any steps so secured are to be replaced as soon as reasonably practicable by a step secured in position by the method used in the original construction of the pilot ladder. Where a replacement step is secured to the side ropes of a pilot ladder by means of grooves in the sides of the step, the grooves must be in the longer side of the step.



7. The side ropes of the pilot ladder are to consist of two uncovered manila ropes, each of which must be not less than 20 millimetres in diameter and continuous with no joints below the top step of the pilot ladder.

8. The pilot ladder is to be provided with battens that will prevent the ladder from twisting, each batten being made of hardwood or other material of equivalent properties, made in one piece free of knots or other defects and not less than 1,800 millimetres in length. Each batten is to be integral with a step. The interval between any batten and the next is not to exceed 9 steps and the lowest batten must not be lower than the fifth step from the bottom of the ladder.

9. Two manropes of uncovered manila, of the same length as the ladder, without knots or joints and not less than 32 mm in diameter, and a safety line are to be provided for use with pilot ladders. The top ends of the manropes are to be secured to the vessel not more than 800 millimetres apart.

10. Means shall be provided to ensure safe and convenient passage on to or into or off the vessel between the head of the pilot ladder or of any accommodation ladder or other appliance provided.

10.1 Where the passage between the top of the ladder and the vessel is by means of a gateway in the rails or bulwark, adequate hand holds shall be provided; or

10.2 Where passage between the top of the ladder and the vessel is by means of a bulwark ladder, that ladder shall be securely attached to the deck and two hand hold stanchions shall be securely attached to the deck and two hand hold stanchions shall be fitted not less than 700 millimetres or more than 800 millimetres apart at the point of boarding or leaving the vessel. These stanchions shall:

10.2.1 be rigidly attached to the structure of the vessel at or near the base of the stanchions and also at a higher point;

10.2.2 be not less than 40 millimetres in diameter; and

10.2.3 extend not less than 1200 millimetres above the top of the bulwark.

11. For use in connection with the pilot ladder, a vessel is to be provided with:

11.1 a lifebuoy equipped with a self-igniting light; and

11.2 a heaving line of adequate length in relation to the freeboard of the vessel which must be kept at hand for immediate use while the pilot ladder is rigged.

12. Sufficient lighting must be provided to adequately illuminate the pilot ladder, the accommodation ladder or mechanical pilot hoist (if any) and the position at which the pilot boards the vessel. The lighting may be fixed or portable but in the latter case the light or lights must be secured so as to provide steady illumination.

13. Where the constructional features of a vessel would prevent compliance with any of these provisions, special arrangements may be approved by the Fiji Marine Board to ensure safe embarkation and disembarkation of pilots and other persons to and from the vessel.

14. If a vessel has such a low freeboard that the provision of a pilot ladder is not considered necessary it may be exempted from carrying a pilot ladder. The other provisions in regard of safe means of passage through or over the bulwark, hand holds and lighting still apply.

## Appendix J

## MECHANICAL PILOT HOISTS

## 1. General

1.1 A mechanical pilot hoist shall be of a type approved by the Fiji Marine Board and shall be required to comply with the provisions contained in this Appendix. Design and construction shall be such as to ensure that the pilot can be embarked and disembarked in a safe manner including a safe access from the hoist to the deck and vice versa. The hoist must be used solely for the embarkation and disembarkation of pilots and persons on official business.

1.2 A pilot ladder complying with the provisions of Appendix I is to be rigged adjacent to the mechanical pilot hoist and available for immediate use.

1.3 The working load should be the sum of the weight of the ladder and falls in the fully lowered condition and the maximum number of persons which the hoist is designed to carry; the weight of each person being taken as 150 kg.

1.4 Every pilot hoist must be of such construction that when operating under the defined "working load" each component other than a wire rope fall has a minimum factor of safety of 5.0 having regard to the material used, the method of construction and the nature of its duty.

In the case of a pilot hoist davit made of cast steel or of wrought steel or other material fabricated by a welding process, the davit and its attachments at full outreach are to be capable of withstanding a static load test of not less than 2.2 times the "working load".

The attachments at the davit head from which the blocks are suspended must be capable of withstanding of proof-load test of not less than 2.5 times the "working load".

In the case of metal blocks, the material used must be of ductile quality and adequate strength and the block must be capable of withstanding a proof load test of not less than 2.5 times the working load on the davits.

The breaking tensile load of ropes used for raising and lowering the "mechanical hoist" from advits must be not less than 6 times the working load on each wire.

In selecting the material of construction, due regard should be paid to the conditions under which the hoist will be required to operate.

1.6 The pilot hoist should be located within the parallel body length of the vessel and clear of all discharges.

1.7 The operator shall be able to control the hoist, even in its, lowest position.

1.8 The manufacturer of the pilot hoist is to supply with each installation an approved maintenance manual, together with a maintenance log.

The Master of a vessel shall ensure that the pilot hoist is kept in good order and is maintained in accordance with the approved maintenance manual and that the hoist is examined at intervals of not more than 6 months. An entry is to be made in the maintenance log after each examination and both manual and log are to be available for inspection by a Surveyor.

## 2. Construction

2.1 The hoist will generally consist of the following three main parts, but hoists of other equally efficient construction may be considered:

2.1.1 a mechanical powered appliance together with means for a safe passage from the hoist of the deck and vice versa;

2.1.2 two separate falls;

2.1.3 (a) a rigid upper part for the transportation of the pilot upwards or downwards;

2.1.3 (b) a lower part consisting of a short length of pilot ladder, which enables the pilot to climb from the pilot launch to the upper part of the hoist and vice versa.

### 3. Mechanical powered appliance

3.1 The source of power for the winches may be electrical, hydraulic or pneumatic except that an electrical power system may not be used on vessels carrying inflammable fluids in bulk.

3.1.1 In the case of a pneumatic or hydraulic power winch, the power supply and any reticulation shall:

3.1.1 (a) have a capacity to raise and lower the pilot hoist loaded to its working load:

(i) twice, the second operation being effected immediately following completion of the first operation; and

(ii) for a total of five operations over a period not exceeding 30 minutes;

3.1.1 (b) be such that operation of the winch will not adversely affect the satisfactory operation of any other connection item or appliance essential to the safe operation of the vessel; and

3.1.1 (c) be such that operation of any other connected item or appliance essential to the safe operation of the vessel will not adversely affect the operation of the winch.

3.1.2 If the source of power is electric, the motor and electrical equipment are to be designed to operate on a wet exposed deck.

3.1.3 If the source of power is hydraulic the liquid must not freeze in ambient temperature above  $-10$  degrees (C).

3.2 The design of the winch should include a brake or other equally effective arrangement such as a properly constructed worm drive, which is capable of supporting the working load in the event of power failure. If the brake is exposed to the weather, it must be capable of withstanding a test with the braking surface wetted.

3.3 Efficient hand gear should be provided to lower or recover the pilot at a speed of not less than 10 metres per minute in the event of power failure. The brake or other arrangement required in sub-item 3.2 above should be capable of supporting the working load when the hand gear is in use.

3.4 Crank handle(s) provided for manual operation should, when engaged, be interlocked so that the power supply is automatically cut off.

3.5 Hoists should be fitted with safety devices to automatically cut off the power supply before the ladder comes against any stop to avoid overstressing the falls or other parts of the hoist. However, in the case of hoists operated by pneumatic power, if the maximum torque available from the air motor cannot result in overstressing of the falls or other parts of the hoist, the safety cut-out device may be omitted.

3.6 All hoist controls should incorporate an emergency stop to cut off the power supply.

3.7 The winch controls should be clearly and durably marked to indicate the action to "Hoist", "Stop" and "Lower". The movement of these controls should correspond with the movement of the hoist returning to the stop position when released.

3.8 Efficient arrangements should be provided to ensure that the falls wind evenly onto the winch-drums.

3.9 Pilot hoists should be securely attached to the structure of the vessel. Proper and strong attachment points should be provided for hoists of the portable type on each side of the vessel. Attachment of the pilot hoists should not be solely by means of the vessel's side rails.

3.10 The winch should be capable of hoisting or lowering the pilot(s) at a speed of between 15 and 30 metres per minute.

3.11 There should be safe means of access between the top of the hoist and the deck and vice versa; such access should be gained directly by a platform securely guarded by handrails.

3.12 Any electrical appliance associated with the ladder section of the hoist should be operated at a voltage not exceeding 25 volts.

### 4. Falls

4.1 Two separate falls are to be used, manufactured from flexible steel wire of adequate strength and resistance to corrosion in a salt-laden atmosphere.

4.2 Wire ropes should be securely attached to the winch-drums and the ladder. These attachments should be capable of withstanding proof load of not less than 2.2 times the load on such attachment. The falls should be maintained at a sufficient relative distance from one another.

4.3 The wire rope falls are to be of sufficient length to allow for all conditions of freeboard encountered in service and to retain at least three full turns on the winch drums with the hoist in its lowest position against the side of the vessel.

### 5. Ladder Section

The ladder is to consist of an upper rigid section and a lower flexible section.

5.1 The rigid section must be not less than 2.5 metres in length and so constructed and equipped that the pilot can maintain a safe position whilst being hoisted or lowered.

The rigid section must be provided with:

5.1.1 steps which comply with the requirements of item 5 of the requirements of Appendix I for pilot ladders, except that rubber may not be used for the steps;

5.1.2 a spreader at the lower end of not less than 1.80 metres fitted with an efficient roller at each end which is to roll freely against the side of the vessel, during the whole operation of raising or lowering the hoist;

5.1.3 an effective guard ring, suitably padded, positioned and secured as to furnish physical support for the pilot without hampering his movements;

5.1.4 suitable protection against extremes of temperature to provide safe hand holds;

5.1.5 means of communication between the pilot and the winch operator or the responsible officer supervising the operation; and

5.1.6 an emergency stop switch within reach of the pilot by means of which he may cut off the power supply to the winch.

5.2 The lower section is to consist of a section of pilot ladder of a length equivalent to 8 steps, complying with requirements of items 5 to 7 inclusive of the requirements of Appendix J for pilot ladders.

5.3 The steps of the flexible lower section and those of the upper rigid section must be in the same vertical line and the steps are to be equidistant in both sections. The hand holds of both sections of the ladder are to be aligned as closely as possible.

#### 6. Operational aspects

6.1 Rigging and testing of the hoist and the embarkation and disembarkation of a pilot should be supervised by a responsible officer of the vessel. Personnel engaged in rigging and operating the hoist should be instructed in the safe procedures to be adopted and the equipment should be tested prior to the embarkation or disembarkation of a pilot.

6.2 Lighting should be provided at night such that the pilot hoist overside, its controls and the position where the pilot boards the vessel should be adequately lit. A lifebuoy equipped with a self-igniting light should be kept at hand ready for use. A heaving line should be kept at hand ready for use if required.

6.3 The position on the vessel's side where the hoist will be lowered should be indicated as well as possible.

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

6.5 The assembly and operation of the pilot hoist should form part of the vessel's routine drills.

#### 7. Testing

7.1 Every new pilot hoist should be subjected to an overload test of 2.2 times the working load. During this test the load should be raised to a distance of not less than 5 metres.

7.2 An operating test of 10 per cent overload should be carried out after installation on board the vessel to check the attachment and performance of the hoist to the satisfaction of the Fiji Marine Board.

7.2 Subsequent examination of the hoist under working conditions should be made at the time of each survey of equipment for the renewal of the vessel's Certificate.

## MEDICINES AND MEDICAL STORES

### 1. Requirement

1.1 The requirement for medicines and medical stores to be carried on board vessels is based on two parameters; the area of operations of the vessel, and the total number of persons to be carried on the vessel according to its Certificate of Survey.

1.2 Medical Stores as listed in Tables I and II shall be inspected and supplies to the ships to which these Tables apply, to the satisfaction of a qualified pharmacist, who shall then issue a Certificate of Inspection of Medical Stores.

Such Certificate shall have a validity not exceeding 12 months.

Medical Stores as listed in Tables III and V shall be inspected by a Marine Board Surveyor as part of the Semi-Annual Safety Equipment Survey.

### 2. Medical Cabinet

2.1 A medical cabinet of suitable size, design and construction shall be provided for storing the medicines, etc.

2.2 This cabinet shall be located:

2.2.1 in a separate compartment adjacent to the hospital accommodation; or

2.2.2 where hospital accommodation is not provided, adjacent to the vessel's officers' accommodation.

2.3 The cabinet shall be provided with:

2.3.1 an outer door, fitted with an efficient lock;

2.3.2 an inner cupboard, independently locked, for storing special drugs (noted on Scales);

2.3.3 a dispensing counter or table, with an impervious surface;

2.3.4 suitable storage space for medicines and measuring devices, which facilitate identification of various items; and

2.3.5 illumination by electric light from inside or immediately outside the cabinet.

### 3. First-Aid Case

3.1 A watertight first-aid case of suitable size and strength, but being easily portable, shall be provided for storing the first-aid items.

3.2 This case shall be located adjacent to the Master's accommodation, or in the wheelhouse. In small partly open vessels, the case shall be stowed so as to protect it from incoming spray and the weather.

3.3 This case shall be provided with:

3.3.1 an efficient lock;

3.3.2 suitable storage space for medicines and measuring devices, which facilitate identification of various items; and

3.3.3 a torch or hand lamp.

#### 4. Exemptions

4.1 Where the Fiji Marine Board decides on the basis of the area of operations of a vessel, its activities, and the total number of persons to be carried, that the required Medical Scale may not be the most appropriate for that vessel, the Fiji Marine Board may modify or change such Scale, or may exempt such vessel from carrying medicines or medical stores in accordance with this Appendix.

#### 5. Medical Scales

5.1 A ship shall carry medical stores and publications as prescribed in the following table and the annex to this Section.

Ship and Trade .....	Medical Scale
International Voyages	Table I
1600 gross tonnage and over .....	
Less than 1600 gross tonnage .....	Table II
Restricted Pacific Trade	Table II
1600 gross tonnage and over .....	
Less than 1600 gross tonnage .....	Table III
Fiji Islands Trade, Seagoing and Short Coasting Trades	
1600 gross tonnage and over .....	Table III
Less than 1600 gross tonnage .....	Table IV

#### 5.2 Table I

The table is based on a six-month voyage and is divided into two categories: for ships carrying up to 40 persons, and for ships carrying over 40 persons. Double the quantity of medicines and dressings should be carried for voyages extending up to 12 months except where indicated by an X, when the amount should be a fixed quantity regardless of the length of the voyage. For instruments, appliances and general medical equipment the amounts carried should be a fixed quantity regardless of the length of the voyage, unless otherwise indicated.

#### 5.3 Table II

Items marked (\*) need not be carried in ships whose voyages are normally never more than 12 hours away from a port of call. For instruments, appliances, and general medical equipment the amounts carried should be a fixed quantity regardless of the length of the voyage, unless otherwise indicated.

#### 5.4 Table III

Medicines, dressings, and general medical equipment marked (\*\*) may be reduced by 50% in ships carrying less than six persons. For instruments, appliances, and general medical equipment the amounts carried should be a fixed quantity regardless of the length of the voyage, unless otherwise indicated.

#### 5.5 Table IV

Present a minimal scale for smaller Near Coastal Trade Vessels.

Note: The above Scales are all minimum requirements. The Fiji Marine Board may require higher standards in respect of the number of persons normally carried or the special nature of the vessel or its operation.

#### 5.6 General:

Formulae for certain medicines are given in the right-hand columns for the information of chemists.

Where provided for in the tables the chemist may supply an equivalent drug, but the container must carry a special label stating that the item is the equivalent of the standard item in the table, so that the captain is left in no doubt about its purpose.

The adult dose of all medicines must be clearly shown on labels, which must be rendered durable by varnishing.

All containers labelled "Poison" must be supplied in distinctive bottles and these, together with other container labelled "For external use only", must be stored in the inner cupboard. The keys for this locker are retained by the captain, who may issue one key to the officer or other person to whom he delegates responsibility for the sick on board.

### MEDICAL SCALES

#### 5.7

Item	Table I		Table II	Table III	Table IV	Additional information for use of chemist and for labelling
	Up to 40	Over 40				
	Quantities for ships carrying the under mentioned number of persons					
Medicines						
1. Auristillae glyceris (Glycerine ear drops) EAR DROPS	30 ml	60 ml	30 ml	..	..	Supply in bottle of distinctive design with dropper.
2. Capsule amyli nitris (Amyl nitrite capsule) X	6	6	6	..	..	Each capsule 0.3 ml amyl nitrite, covered with absorbent fabric. To be renewed after 12 months.
3. Capsule tetracyclini hydrochloridi (Tetracycline) hydrochloride capsules) TETRACYCLINE CAPSULES	80	160	80(*)	..	..	Each capsule 250 mg tetracycline hydrochloride, or an equivalent broad-spectrum antibiotic with similar therapeutic effects (to be so labelled).
4. Compressi acidi (Acetylsalicycli acid tablets) ASPIRIN TABLETS	250	500	200	100	100	Each tablet 300 mg acetylsalicycli acid.

Item	Table I		Table II	Table III	Table IV	Additional information for use of chemist and for labelling
	Quantities for ships carrying the under mentioned number of persons					
	Up to 40	Over 40				
5. Compressi aminophyllini (Aminophylline tablets) AMINOPHYLLINE TABLETS X	20	40	20 (*)	..	..	Each tablet 300 mg aminophylline. Label "POISON"—to be used only on medical advice by radio.
Medicines (Continued)						
6. Compressi Butobarbitali (Butobarbitone tablets) SEDATIVE TABLETS	40	80	20(*)	..	..	Each table 100 mg butobarbitone. Supply in bottle of distinctive design. Label "POISON".
7. Compressi chloroquini sulfatis (Chloroquine sulfate tablets) MALARIA TABLETS X	300	500	100	..	..	Each table 150 mg chloroquine base chloroquine sulfate 200 mg. Chloroquine phosphate 250 mg may be supplied as an alternative.
			(only for ships operating in malarious areas)			
8. Compressi chlorothiazidi (Chlorothiazide tablets) X	20	40	20(*)	..	..	Each tablet 500 mg chlorothiazide. Supply in bottle of distinctive design. Label "POISON" to be used only on medical advice transmitted in plain language and not by code.
9. Compressi chlorpromazini hydrochloridi (Chlorpromazine hydrochloride tablets) TRANQUILLIZER TABLETS X	20	40	20(*)	..	..	Each tablet 50 mg chlorpromazine hydrochloride. Supply bottle of distinctive design used only on medical advice by radio.
Medicines (Continued)						
10. Compressi codeini phosphatis (Codeini phosphate tablets) CODEINI TABLETS	200	300	100	40	..	Each tablet 15 mg codeini phosphate or an equivalent drug with similar therapeutic effects (to be labelled).
11. Compressi colocynthis et jalapae co. (Compound) colocynth and jalap tablets) VEGETABLE LAXTION TABLET	100	200	40	40(**)	40(**)	Each tablet 60 mg compound colocynth extract/15mg hyoscyamus dry extract/15 mg jalap resin/15 mg prodophyllum resin/0.006 ml peppermint oil or an equivalent laxative with similar therapeutic effects (to be so labelled).

Item	Table I		Table II	Table III	Table IV	Additional information for use of chemist and for labelling
	Quantities for ships carrying the under mentioned number of persons					
	Up to 40	Over 40				
12. Compressi digoxini (Digoxin tablets) X	20	20	20	..	..	Each tablet 0.25 mg digoxin. Supply in bottle of distinctive design Label "POISON"—to be used only on transmitted in plain language and not by code".
13. Compressi ephedrini hydrochloridi (Ephedrine hydrochloride tablets) EPHEDRINE TABLETS	60	100	40	20	..	Each tablet 30 mg ephedrin hydrochloride.
14. Compressi glycerylis trinitratis (Glyceryl trinitrate tablets) HEART TABLETS	20	40	20	..	..	Each tablet 0.5 mg glyceryl trinitrate. Supply on bottle of distinctive design. Label "POISON".
15. Compressi Hyoscini Hydrobromidi (Hyoscine hydrobromide tablets) SEASICKNESS TABLETS	100	200	50	50(**)	..	Each tablet 0.3 mg hyoscine hydrobromide, or an equivalent drug with similar therapeutic effects (to be so labelled). Supply in bottle of distinctive design. Label "POISON".
16. Compressi Kalii permanganatis (Potassium Permanganate tablets)	50	100	20	20	..	Each tablet 60 mg potassium permanganate. Label "One tablet dissolved in 600 ml of water may be used as an antiseptic lotion or stomach wash".
17. Compressi magnasii trisilicatis (Magnesium trisilicate tablets) STOMACH TABLETS	250	500	100	100	..	Each tablet 250 mg magnesium trisilicate/20 mg dried aluminium hydroxide gel/0.02 ml peppermint oil.
18. Compressi natrii chloridi solv. (Sodium chloride tablets) SALT TABLETS X	1,000	2,000	500	250	..	Each tablet 500 mg sodium chloride. 200 mg dextrose. Double the quantity to be carried in vessels spending long period in tropical areas.

Item	Table I		Table II	Table III	Table IV	Additional information for use of chemist and for labelling
	Quantities for ships carrying the under mentioned number of persons					
	Up to 40	Over 40				
19. Compressi pheno barbitali (Phenobarbitone tablets) <b>PHENOBARBITONE TABLETS</b>	50	100	40	20	..	Each tablet 30 mg phenobarbitone. Supply in bottle of distinctive design. Label "POISON".
20. Compressi phenoxymethylpenicillini (Phenoxymethylpenicillin tablets) <b>PENCILLIN TABLETS</b>	300	600	120	60	..	Each tablet 125 mg phenoxymethylpenicillin. Store in a cool dry place in a container which will prevent access of moisture.
21. Compressi proguanili hydrochloridi (Proguanil hydrochloride tablets)	100	200	100	100	100	Each tablet 100 mg proguanil hydrochloride. For ships proceeding on voyages to malarious areas the quantity is to be increased to 50 tablets per crew member.
22. Compressi promethazini hydrochloridi (Promethazine hydrochloride tablets) <b>ANTIHISTAMINE TABLETS</b>	40	60	40	20	..	Each tablet 25 mg promethazine hydrochloride or an equivalent antihistamine with similar therapeutic effects (to be so labelled).
23. Compressi sulfamidini (Sulfadimidine tablets) <b>SULFONAMIDE TABLETS</b>	200	400	100	..	..	Each tablet 500 mg sulfadimidine or an equivalent sulfonamide with similar therapeutic effects (to be so labelled). Supply in bottle of distinctive design. Label "POISON".
24. Compressi sulfamethoxypridazini (Sulfamethoxypridazine tablets) <b>SMP TABLETS X</b>	300	600	100	..	..	Each tablet 500 mg sulfamethoxypridazine. Supply in bottle of distinctive design. Label "POISON".
25. Conspersus dicophani (DDT dusting powder) <b>INSECTICIDE POWDER</b>	500g	1,000g	250(*)	..	..	A white powder for application to persons and their clothing; harmless to skin and clothing and designed to destroy human infestation by insects and mites. Instructions for use on the label and insufflator included.

Item	Table I		Table II	Table III	Table IV	Additional information for use of chemist and for labelling
	Quantities for ships carrying the under mentioned number of persons					
	Up to 40	Over 40				
26. Conspersus zinci, amyli et talci (Dusting powder of zinc, starch, and talc) <b>ZINC DUSTING POWDER</b>	150g	250g	150g	..	..	A white powder consisting of 25% zinc oxide, 25% starch, and 50% talc (by weight). Label "External use".
27. Conspersus zinci undecenoatis (Dusting powder of zinc undecenoate) <b>RINGWORM POWDER</b>	120g	250g	120(*)	..	..	A powder consisting of 500g starch 100g zinc undecenoate. 2.8 undecenoic acid 4.7 ml pumilio pine oil, and 1000g lihy kaolin.
28. Dimethylphtalas Dimethylthalate) <b>INSECT REPELLENT</b>	One	bottle	per	crew	member	To be carried on all vessels proceeding to malarious ports. The supply per individual should be considered adequate for seven days. To be increased if the vessel remains longer in a malarious area. 50-ml bottle. Label "External use".
29. Guttae sulfacetamidii Sulfacetamide eye drops <b>ANTISEPTIC EYE DROP X</b>	30 ml	60 ml	30 ml (*)	30 ml	..	A solution of sulfacetamide sodium 10% for eye drops. Supply in bottle of distinctive design with dropper.
30. Guttae tetracainaer (Tetracaine eye drops) <b>ANAESTHETIC EYE DROPS X</b>	30ml	30ml	30ml	30ml	..	A solution of tetracaine hydrochloride, 1% for eye drops. Supply in bottle of distinctive design with dropper. Label "External use—POISON".
31. Injectio adrenalini (Adrenaline injection) <b>ADRENALINE INJECTION</b>	5	..	5(*)	3	..	Each ampoule 1 mg adrenaline. Supply in "Ampins". Label "To be used only on medical advice, except in case of anaphylactic shock due to penicillin injection".

Item	Table I		Table II	Table III	Table IV	Additional information for use of chemist and for labelling
	Quantities for ships carrying the under-mentioned number of persons					
	Up to 40	Over 40				
32. Injunctio benzylpenicilline (rocaïne penicillin G injection) PENICILLIN INJECTION	50	100	25(*)	25	..	Each ampoule 600,000 international units of procaine penicillin in a sterile suspension in water or an equivalent antibiotic with similar therapeutic effects (to be so labelled). Store in a cool, dry place and renew when necessary.
33. Injunctio morphini sulfate injection) MORPHINE INJECTION X	10	20	5	2	..	Each ampoule 15 mg morphine sulfate. Supply in "Ampins". Label "POISON".
34. Injunctio natrii Chloridi (Sodium chloride injection) NORMAL SALINE INJECTION)	4	6	4(*)	..	..	Each bottle 1,000 ml water with 9 g sodium chloride, sterile. Supply administration set and instructions.
35. Injunctio streptomycini sulfatis (streptomycin sulfate injection) STREPTOMYCIN INJECTION	6	12	6(*)	..	..	Each ampoule 1,000 mg streptomycin as a sterile solution. Store in a cool dry place and renew when necessary.
36. Injunctio tetracyclini hydrochloridi (Tetracycline hydrochloride injection) TETRACYCLINE INJECTION	6	12	3	..	..	Each ampoule 100 mg tetracycline or an equivalent broad-spectrum antibiotic similar therapeutic effects (to be so labelled).
37. Linctus scillae opiatu (Linctus of squill, opiate) COUGH LINCTUS	500 ml	1,000 ml	250 ml	250 ml (*)	..	A mixture in equal volumes of camphorated opium tincture, oxymel of squill, tolu syrup, or an equivalent mixture with similar therapeutic effect (to be so labelled).
38. Linimentum methylis salicylatis (Methyl salicylate liniment) SALICYLATE LINIMENT	250 ml	500 ml	250 ml (*)	..	..	Supply in bottle of distinctive design. Label "External use". Not for burns".
39. Lotion calminae (Calamine lotion) CALAMINE LOTION	500 ml	1,000 ml	250 ml	250 ml (**)	..	Supply in bottle of distinctive design. Label "External use".

Item	Table I		Table II	Table III	Table IV	Additional information for use of chemist and for labelling
	Quantities for ships carrying the under-mentioned number of persons					
	Up to 40	Over 40				
Medicines (Continued)						
40. Lotion cetrimidi (Cetrimide Lotion) ANTISEPTIC SOLUTION	500 ml	1,000 ml	250 ml	250 ml (**)	250 ml (**)	A solution of cetrimide 1% in water or equivalent. Supply in bottle of distinctive design.
41. Magnesium hydroxidum (Magnesium hydroxide mixture) LIQUID LAXATIVE	500 ml	1,000 ml	250 ml	250 ml (**)	..	Label "External use". A mixture containing 7.9% by weight of magnesium hydroxide with peppermint oil flavouring.
42. Mistura Kaolini et Morphinae (Kaolin and morphine mixture) DIARRHOEA MIXTURE	250 ml	500 ml	250 ml (*)	..	..	A mixture containing 2,000 mg light kaolin, 650 mg sodium bicarbonate 0.75 ml chloroform and morphine tincture, water to 15 ml (in each dose).
43. Natrii ephedrinae (Ephedrine nose drops) NOSE DROPS X	30 ml	60 ml	30 ml	..	..	A solution of norephedrine hydrochloride 1% for nasal drops. Supply in bottle of distinctive design with dropper. (Label "External use".
44. Natrii bicarbonatas (Sodium bicarbonate)	125 g	250 g	125 g	..	..	..
45. Oleum arachidis (Arachis oil)	250 ml	500	250 ml	..	..	Oleum olivae (olive oil) may be supplied as alternative.
46. Oleum caryophylli (Oil of cloves) TOOTH ANAESTHETIC X	30 ml	30 ml	30 ml	..	..	Supply in wide-mouthed bottle of distinctive design. Label "External use".
47. Paraffinum molle flauum (Yellow soft paraffin) SOFT PARAFFIN	125 g	250 g	125 g	125 g	125 g	..
48. Tincture benzoini composita (Tincture of benzoin compound) INHALATION MIXTURE	100 ml	200 ml	100 ml	100 ml (*)	..	A mixture containing 10 g crushed benzoin 7.5 prepared storax, 2.5 g tolu balsam, 2 g aloes, alcohol (90%) to 100 ml. Label "External use". "Add 5 ml to 500 ml hot water and inhale vapours".
49. Unguentum acidi benzoici (Compound benzoic acid ointment)	100 g	200 g	100 g (*)	..	..	An ointment containing 6% benzoic acid 3% salicylic acid, 91% emulsifying ointment.

Item	Table I		Table II	Table III	Table IV	Additional information for use of chemist and for labelling
	Quantities for ships carrying the under mentioned number of persons					
	Up to 40	Over 40				
50. Unguentum bacitracini (Bacitracin ointment) <b>ANTIBIOTIC OINTMENT</b>	120 g	240 g	60 g	60 g	15 g	An ointment containing bacitracin in a soft paraffin base. Supply in 15 g tube.
51. Unguentum benzocaini Compositum (Compound benzocaine ointment) <b>HAEMORRHOID OINTMENT</b>	120 g	180 g	120 g	..	..	An ointment containing 10% benzocaine 45% zinc ointment, 45% hamamelis ointment. Supply in 15 g tubes.
52. Unguentum gammabenzeni hexachloridi (Gammabenzene hexachloride ointment) <b>ANTI-SCABIES OINTMENT X</b>	150 g	300 g	150 g	..	..	An ointment containing gamma benzene hexachloride 1%. Supply in 50 g tube.
53. Unguentum xylocaini (Xylocaine ointment) <b>LOCAL ANAESTHETIC OINTMENT</b>	60 g	120 g	30 g(*)	..	..	An ointment containing 5% xylocaine hydrochloride. Supply in 15 g tube.
54. Unguentum (Zinc oxide ointment) <b>ZINC OINTMENT</b>	200 g	400 g	100 g	100 g	100 g	An ointment containing 15% zinc oxide.

Item	Table I		Table II	Table III	Table IV	Additional information for use of chemist and for labelling
	Quantities for ships carrying the under mentioned number of persons					
	Up to 40	Over 40				
Instructions						
1. Eye spud with covered point	1	1	1	..	..	To be made of stainless steel
2. Forceps: dental packing	1	1	1	..	..	To be made of stainless steel
3. Forceps: dissecting	1	1	1	..	..	To be made of stainless steel
4. Forceps: Haemostatic	2	2	1	1	..	To be made of stainless steel, length 15 cm
5. Forceps: sinus	1	1	1	..	..	To be made of stainless steel, length 15 cm
6. Forceps: splinter	1	1	1	..	..	To be made of stainless steel, with wide oblique ends
7. Scalpel: handle	1	1	1	..	..	No. 3 handle. Suitable for standard scalpel blades
8. Scalpel: blades	6	6	6	..	..	No. 10 or No. 11 blades
9. Scissors	1	1	1	1	1	To be made of stainless steel, one blade sharp-pointed, the other blunt-pointed. Length 15 cm
10. Thermometer	3	6	2	2	2	Lens-fronted, stubby-end, half minute thermometer, with metal or plastic case.
11. Canvas roll for above instruments	1	1	1	..	..	
12. Applicators	50	50	25	25	25	To be made of wood
13. Artificial airway	1	2	1	1	1	For mouth-to-mouth breathing
14. Injection syringe: 2 ml	2	2	..	..	..	Both syringes: glass body with metal plunger and nozzle for standard needles
15. Injection syringes: 5 ml	2	4	1	1	1	Supplies in metal case.
16. Injection needles: hypodermic diameter 6 length 25 mm	10	20	6	6	..	Alternatively, complete disposable syringes, in which case the quantities indicated here for the needles will apply to each size of syringe



Item	Table I		Table II	Table III	Table IV	Additional information for use of chemist and for labelling
	Quantities for ships carrying the under mentioned number of persons					
	Up to 40	Over 40				
Instruments (Continued)						
17. Injection needles: intramuscular-diameter 8, length 40 mm	10	20	6	6	..	
18. Luer adaptors for syringe	1	1	..	..	..	For use with hypodermic syringes to enable any type of needle to be used
19. Tongue depressors	30	60	20	20	..	To be made of wood.
20. Catheter sets: olivary ends	1	1	1	..	..	Set size 6, 10, 14 F or 3, 5, 7 UK
21. Catheter sets: soft rubber	1	1	1	..	..	One of each together with stilettes in a closed glass or plastic cylinder with a sprinkling of powdered talc: or a suitable number of disposable plastic catheters in the same sizes.
22. Enema kit	1	1	1	..	..	To consist of graduated funnel, rubber, tubing 1 metre long with control clamp attached, connexion and rubber catheter. Supply in a box plainly labelled "FOR ENEMA USE ONLY".
23. Stomach tube	1	1	1	..	..	Standard rubber or plastic 1 m long and fitted with plastic funnel. Tube to bear a mark indicating when its tip has reached the stomach.
<b>Appliances</b>						
24. Splints: common set	1	1	1	1	..	Wooden splints. Suitable for fractures of limbs and hands
25. Splints: serrated, of Gooch type	1	1	1	..	..	A sheet of split 1 m x 1m
26. Splints: thigh wooden	1	1	1	..	..	Largest size
27. Splints: metal set	1	1	1	..	..	Metal with padded ring. One set of three
28. Tourniquet	1	1	1	1	1	smarch or Samways type

Item	Table I		Table II	Table III	Table IV	Additional information for use of chemist and for labelling
	Quantities for ships carrying the under mentioned number of persons					
	Up to 40	Over 40				
Instruments (Continued)						
29. Truss: single right pad	1	1	1	..	..	Elastic band types with adjustable buckles. The bands to be not less than 1 m in length
30. Truss: single left pad	1	1	1	..	..	
31. Truss: double pads	1	1	1	..	..	
32. Ligatures catgut	3	5	2	..	..	In sealed glass tubes sterilized with a fracture scratch and directions for breaking the tube
<b>Appliances (Continued)</b>						
33. Sutures with needles	4	8	2	..	..	Sutures of nylon or silk fitted to eyeless needles with a cutting edge, in sterile sealed glass tubes with fracture scratch and directions for breaking tube. Half to be straight needles, half to be curved
34. Suture strips, non-stitch	24	48	12	12	..	Size 2.5 x 50 cm. Butterfly or dumbbell shape for drawing superficial wounds together in sterile sealed packet
35. Suspensory bandages with understraps	2	4	2	2	..	Half to be of medium size and half to be of large size.
<b>Dressings</b>						
36. Adhesive elastic bandage, box	2	4	2(*)	2	..	5 cm x 1 m. Supply in a metal container.
37. Adhesive plaster: small	1	2	1	1	..	Zinc oxide plaster. Supply on a spool, 2.5 cm x 1m
38. Adhesive plaster: large	1	2	1	..	..	7.5 cm x 1.5 m, Zinc oxide plaster. Supply on a spool
39. Bandage crepe	4	6	2	2	..	7.5 cm x 1.5 cm. Each separately with size on label
40. Bandage roll, gauze open weave: small	10	20	10	10	..	2.5 cm x 3 m Each separately wrapped with size on label
41. Bandage roll, gauze open weave: medium	10	20	10	10	10	5.0 cm x 4 m Each separately wrapped with size on label

Item	Table I		Table II	Table III	Table IV	Additional information for use of chemist and for labelling
	Quantities for ships carrying the under mentioned number of persons					
	Up to 40	Over 40				
42. Bandage roll, gauze open weave: large	10	20	10	10	..	7.5 cm x 4 m Each separately wrapped with size on label
43. Bandage triangle	4	8	2	2	1	1 x 1 x 1.3 m Each separately wrapped with size on label.
44. Burn and wound dressing box	5	10	3	3	3	10 x 10 cm. Sterile bleached cotton or rayon cloth evenly impregnated with yellow soft paraffin, in a polythene envelope hermetically sealed and free from moisture. Ten envelopes per box.
45. Dressing adhesive strip	2	2	1	1	..	6 cm x 1 m in a sterile packet
46. First aid/emergency dressings: small	3	6	3	3	..	7.5 x 10 cm pad. 5 cm x 3 m bandage
47. First aid/emergency dressings: medium	3	6	3	3	3	10 x 15 cm pad. 5 cm x 3 m bandage
48. First aid/emergency dressings: large	3	6	3	3	..	15 x 20 cm pad. 7.5 cm x 4 m bandage
Additional information for 46,47 above: Pad; cottonwool enclosed in absorbent gauze. Bandage: open-weave gauze with pad stitched to it 30 cm from one end. Pad to be folded lengthwise with the surface of the dressing on the inside and the rolled end of the bandage on the outside. Free end of bandage to be wound round the rolled end and the pad. Sterilized in separate sealed wrappers. (Label with size of pad and following instructions. "Unwind short length of bandages, straighten pad by pulling on ends of bandage. Apply pad to wound without touching it. Bandage firmly".						
<b>Dressing</b>						
49. Gauze, plain sterile: small	5	10	5	5	..	30 cm x 1 m Supply in separate packet and label with size and name of item
50. Gauze, plain sterile: large	10	10	3	..	..	1 x 1 m Supply in separate packet and label with size and name of item
51. Gauze absorbent ribbon	1	2	1	1	..	2.5 cm x 3 m Supply in separate packet and label with size and name of item
52. Jaconet or equivalent	1	1	1	..	..	Bleached cotton cloth waterproofed on one side

Item	Table I		Table II	Table III	Table IV	Additional information for use of chemist and for labelling
	Quantities for ships carrying the under mentioned number of persons					
	Up to 40	Over 40				
53. Lint, absorbent cotton: small	5	10	3	3	3	15 x 30 cm Supply in separate packet and label with size and name of item
54. Lint, absorbent cotton: large	10	10	3	..	..	30 x 30 cm Supply in separate packet and label with size and name of item
55. Rolls of cottonwool: small	10	20	10	5	2	20 cm wide, 50 g Supply in separate packet and label with size and name of item
56. Rolls of cottonwool: large	1	2	1	1	..	30 cm wide, 200 g Supply in separate packet and label with size and name of item
57. First aid satchel	1	1	1	1	..	A canvas bag with a strap containing 2 bandages: crepe; 6 bandages: triangle; first aid/emergency dressings, 4 small, 2 medium, 1 large; 1 roll of cottonwool, large; 6 safety-pins, medium; 1 artificial airway
<b>General Medical Equipment</b>						
58. Basins: round	1	1	1	1	1	White enamelled iron, aluminium or plastic, diameter and 10 cm depth. Inscribed "MEDICAL".
59. Basins: Kidney	1	1	1	..	..	White enamelled iron, aluminium or plastic length 25 cm
60. Bed-pan	1	1	1	..	..	White enamelled iron, large size
61. Eye bath	1	2	1	1	..	Made of glass, or plastic that is not affected by boiling
62. Eye Dropper	3	6	3	2(**)	..	Made of glass or plastic that is not affected by boiling

Item	Table I		Table II	Table III	Table IV	Additional information for use of chemist and for labelling
	Quantities for ships carrying the under mentioned number of persons					
	Up to 40	Over 40				
Dressings						
63. Eye shades	3	6	3	2(**)	--	
64. Feeding cup	1	2	1	--	--	Made of porcelain or plastic that is not affected by boiling
65. Finger stalls	3	6	6	4(**)	--	Assorted sizes, leather, or larger quantities if disposable type
66. Hot water bottles	2	2	1	1	--	Rubber with cover
67. Ice bags	1	2	1	--	--	For lowering temperature
68. Measuring glass: small	2	2	1	--	--	Graduated in ml in minims and drachms
69. Measuring glass: large	2	2	1	1	--	Graduated in ml and spoonful doses, or in drachms/ounces and spoonful doses
70. Microscope slides	3	6	3(*)	--	--	Size 1 x 2 m rolled on a wooden core
71. Rubber sheeting	1	2	1(*)	1	--	Size 5 cm, mounted on a card or cards
72. Safety pins	15	30	15	15	10	Waxed cardboard with twist-on lid, wide base, and height not less than 5 cm
73. Sputum pot: disposable or	20	30	10	--	--	Enamelled iron with close-fitting hinged lid
74. Sputum pot: non-disposable	1	1	1	--	--	Size not less than 17.5 x 7.5 cm.
75. Sterilizer	1	1	1	--	--	Electric with automatic cut-out, or steam-heated, or with spirit lamp
76. Stretcher	1	1	1	1	--	Neil Robertson type or equivalent
77. Surgical glove, pairs	2	4	2	--	--	Large size, roughened rubber
78. Temperature charts	5	10	5	--	--	Four-hourly chart combining temperature, pulse, and respiration
79. Urine bottle	1	1	1	1	--	Enamelled iron or plastic, with handle

Item	Table I		Table II	Table III	Table IV	Additional information for use of chemist and for labelling
	Quantities for ships carrying the under mentioned number of persons					
	Up to 40	Over 40				
80. Urine test papers: combined strips albumin/sugar	2	2	1(*)	--	--	Container with close-fitting screw cap of metal, strips together with suitable desiccant (silicagel). Renew after 12 months or earlier if colour changes are noticed. Label "Combined testing strip for albumin and sugar".
81. Salt test paper	2	2	1(*)	--	--	Booklets of 20 test papers impregnated with silver salt, protected from light. Label "Salt in urine test papers. Keep away from light".
82. Bottles: dispensing, small	6	12	5(*)	--	--	60 ml bottles with screw caps. Marked at 4 ml (1 teaspoonful).
83. Bottles: dispensing, large	6	12	5(*)	--	--	180-ml bottles with screw caps. Marked at 15 ml (1 tablespoon)
84. Bottles: poison	5	10	3(*)	--	--	60 ml bottles of distinctive design
85. Dispensing envelopes	100	100	50	--	--	Small size
86. Palette knife	1	1	1	--	--	For dispensing ointments
87. Ointment boxes	15	20	6	--	--	For dispensing ointments. Either chipwood boxes stacked in nests of three, or tins of 15 g
88. Labels: plain	100	100	100	--	--	--
89. Labels: poison	50	50	50	--	--	--
90. Concentrated antiseptic	500 ml	1 litre	500 ml	250 ml	250 ml	A solution of cetriroide 20% in water or equivalent. Label "Concentrated antiseptic lotion" together with full instruction for use. The recommended dilutions to be suitable for the purposes specified.
91. Chloride of lime	--	--	--	--	--	Supply in sealed and dated tins with instructions. The minimum amount to be carried is to be calculated on the

Item	Table I		Table II	Table III	Table IV	Additional information for use of chemist and for labelling
	Up to 40	Over 40				
92. Dilute alcohol	250 ml	500 ml	200 ml (*)	200 ml		amount of stabilized chloride of lime or its equivalent necessary to chlorinate the ship's largest fresh-water tank so as to produce a concentration of one part of free chlorine in one million parts of water  70%. Supply in bottle of distinctive design, and label "External use". Alternatively, surgical spirit may be supplied.
93. Disinfectant	2 litres	4 litres	1 litre	1 litre	1 litre	Supply in bottle of distinctive design and label "Disinfectant" together with full instructions for use. The recommended dilutions to be suitable for the purpose specified. To consist of white fluid in a finely dispersed, stabilized emulsion containing coal tar acids or other phenolic bodies with or without hydrocarbons.
94. Methyl alcohol	500 ml	1 litre	500 ml	..	..	Only if sterilizer is heated by a spirit lamp
95. International Medical Guide for Ships	1	1	1	1	1	Alternative: The Ship Captains Medical Guide (HMSO)
96. World Directory of Venereal Diseases: Treatment Centres at Ports, published by the World Health Organisation	1	1	1	..	..	..
97. Medical First Aid Guide for use in Accidents involving Dangerous Goods. (IMCO)	1	1	1	..	..	..

## Appendix L

## OFFICIAL LOG-BOOK

1. The master of a vessel shall keep an official log-book in an approved form which shall be renewed periodically with no period exceeding two years and the master shall cause to be made in that log such entries as are required by the Fiji Marine Board. Such entries to include:

- (i) Positions of any deck line and load lines;
- (ii) Time and dates of arrival at and departure from each port of call, with the freeboard and draught upon every occasion of the vessel proceeding of sea;
- (iii) Births, deaths and disappearances, on or from the vessel;
- (iv) Illness or injury of persons on board;
- (v) Emergency procedure drills.

2. An entry required by this Section in an official log-book shall be—

- (a) made as soon as possible after the occurrence to which it relates;
- (b) made and dated so as to show the time and date of the occurrence and of the entry respecting it; and
- (c) signed and countersigned.

3. The master shall upon the request of the Fiji Marine Board produce the official log-book for inspection.

4. A person shall not—

- (a) wilfully destroy or mutilate an official log-book or an entry in an official log book;
- (b) wilfully render illegible an entry in an official log-book;
- (c) wilfully make a false or fraudulent entry in, or an omission from, an official log-book; or
- (d) sign an entry in an official log-book knowing the entry to be false or fraudulent.

5. Where for any reason the official log book ceases to be required or is no longer current the master or owner of the vessel shall within one month transmit to the Shipping Office the official log-book made up to the time of cessation.

6. If a vessel is lost or abandoned, the master or owner shall, if practicable, and as soon as possible, transmit to the Shipping Office the official log-book duly made out to the time of the loss or abandonment.

## Appendix M

## ELECTRIC NAVIGATION LIGHTS

## 1. General Conditions

1.1 All lights required to be shown by vessels at sea in accordance with the Collision Convention shall be of a design and construction approved by the Fiji Marine Board.

1.2 The Fiji Marine Board shall not approve any light type specified in subsection 1.1 unless it has been successfully tested by a Maritime Safety Department of the Government of the Country in which the light was manufactured, or a Standards Institute recommended by that Government.

## 2. Marking

2.1 Each light shall by means of a nameplate or other permanent means, bear the manufacturer's name or identifying mark, identification of design compliance and shall show the type of light and type and size of vessel for which it is intended.

2.2 The type and wattages of the proper replacement globe shall be designated by permanent marking on the light.

## SECTION 14

### SURVEYS AND CERTIFICATES OF SURVEY

## SURVEYS AND CERTIFICATES OF SURVEY

## Contents

- PART 1 — PRELIMINARY
- PART 2 — SURVEY REQUIREMENTS
  - A. Initial Survey
  - B. Subsequent Periodic Surveys and Inspections
  - C. Surveys and Inspections other than Initial and Periodic
- PART 3 — CERTIFICATES
  - A. Issue of Certificate
  - B. Extension, Suspension, Cancellation
- PART 4 — MISCELLANEOUS
- PART 5 — SINGLE VOYAGE TOWING PERMIT
- APPENDIX I — ITEMISED SURVEY LIST
  - Part 1 — Semi Annual Sight Surveys, Annual Surveys, Four Yearly Periodical Surveys
  - Part 2 — Safety Equipment Survey
- APPENDIX II — LIST OF APPROVED CLASSIFICATION SOCIETIES
- APPENDIX III — SURVEY FORMS
- APPENDIX IV — SAFETY CONVENTION CERTIFICATE FORMS

## PART I—PRELIMINARY

1. This Section is to be read in conjunction with the Introduction, Definitions and General Requirements Section.

2. This Section applies to all vessels under the jurisdiction of the Marine Board which are required to be surveyed at intervals and to carry onboard evidence of compliance with the survey requirements of the Marine Board. It does not apply to Safety Convention vessels. Such vessels shall comply with the requirements of the Safety Convention.

3. In this Section, unless otherwise indicated:

3.1 "authorised person or society" means a person appointed or recognised by the Marine Board, a society or body and its servants appointed or recognised by the Marine Board, capable by reason of special qualifications of performing surveys and inspections;

3.2 "equipment" in relation to a vessel, includes every thing or article belonging to or to be used in connection with, or necessary for the operation of the vessel and, includes life-saving appliances, fire-fighting appliances, miscellaneous equipment, radio equipment, lights and sound signals and medical stores;

3.3 "inspection" means a visual inspection performed by an approved person;

3.4 "machinery" means boilers, engines, pumps, electrical and ancillary equipment used in the operation of the vessel;

3.5 "survey" means a thorough examination performed by, or in the presence of a Surveyor or an authorised person or society.

3.6 "prescribed form" means a form designed for the purpose, provided by the Marine Board. Such form is to be based on those prescribed in Appendices III and IV.

## PART 2—SURVEY REQUIREMENTS

## A. Initial Survey

4. The Marine Board shall require all new vessels constructed under its jurisdiction, and all existing vessels being brought under survey for the first time, to undergo an Initial Survey. The purpose of this survey shall be to satisfy the Marine Board that the vessel complies with the laws and regulations of the Marine Board.

5. The owner of a vessel to be constructed or of an existing vessel being brought under survey for the first time shall forward to the Marine Board an "Application for Initial Survey" as prescribed by the Marine Board together with the appropriate survey fee.

6. An application for Initial Survey shall be accompanied by the following necessary information:

6.1 type and purpose of vessel;

6.2 intended area of operations;

6.3 whether vessel is to be classed and if so, name of the Classification Society (for an existing vessel, details of any Classification);

6.4 plans and details of hull, machinery and equipment, as required by the Marine Board;

6.5 any existing Tonnage Certificate with calculation;

6.6 such other information as the Marine Board may require and;

6.7 where a vessel is, or is to be classed, the owner shall forward to the Marine Board only such plans and details as are relevant to the Marine Board's own survey and the other plans and details shall be forwarded to the Classification Society;

6.8 the information in respect of a new vessel shall be forwarded prior to the commencement of construction and construction shall not begin until approval has been obtained from the Marine Board;

6.9 the information in respect of an existing vessel shall be forwarded prior to the date of Initial Survey in such time as may be determined by the Marine Board.

7. An Initial Survey shall be carried out in full by the Marine Board Surveyors. On completion of the Initial Survey, the Surveyors shall forward to the Marine Board in writing a report of the condition of the hull and its machinery and equipment and shall make a written declaration of such condition. The report and declaration shall be as prescribed by the Marine Board.

7.1 The Marine Board may accept such part of the survey as performed by an authorised Society.

#### B. Subsequent Periodic Surveys

8. Subsequent to completion of the Initial Survey, the Marine Board shall require all vessels under its survey to undergo Periodic surveys and inspections to satisfy itself that such vessels continue to comply with its laws and regulations. However, the Marine Board may accept such part of the survey as performed by an authorised Society.

9. The intervals between surveys shall be as follows:

9.1 a vessel's equipment shall be surveyed at intervals not exceeding 6 months;

9.2 a vessel's hull, structure, machinery and fittings shall be surveyed at intervals as specified:

(a) in an approved survey programme or  
(b) in Appendix I, except that the Marine Board may require such other lesser intervals if it is considered desirable because of:

- (i) the age of the vessel;
- (ii) the service of the vessel, (e.g. passenger, cargo, salvage, towage);
- (iii) the area or proposed area of operation of the vessel;
- (iv) the materials used and the method of construction
- (v) the type of underwater fittings;
- (vi) the size of the vessel; or
- (vii) any other reason.

10. An owner may submit to the Marine Board for its approval, a survey programme for a vessel. In drawing up such a programme consideration shall be given to the following:

10.1 the survey intervals specified in Appendix I or by the authorised Classification Society;

10.2 such periods as may be required by the Marine Board.

11. Where an approved survey programme is being followed the survey of particular items shall be carried out as detailed in such programme, except where the Marine Board directs otherwise or agrees to modify, defer or cancel the survey programme.

12. It shall be the responsibility of the owner to make an "Application for Survey" as prescribed by the Marine Board, giving such notice as is required by the Marine Board and to forward such application together with the appropriate fee.

13. It shall be the responsibility of the owner to make his vessel available for survey at the agreed time and place.

14. Where a survey or inspection of a vessel's hull is to be carried out, the owner shall cause the vessel to be withdrawn from the water and placed in a satisfactory manner to enable the Surveyor to make an external examination of the hull, underwater fittings, shafting, propeller(s), rudder(s) and any other appurtenances. Prior to such examination the hull shall have been washed and cleaned, but shall not have been painted.

15. During the course of a survey or inspection, the Marine Board's Surveyor shall have discretion to require the opening up for examination of any other parts of the vessel including removal of linings and permanent ballast where applicable.

16. After a survey or inspection, the Surveyor shall make as prescribed by the Marine Board, a duplicate list of repairs and deficiencies which shall be countersigned by the owner who shall retain one copy. The survey will not be completed until such repairs and/or deficiencies have been made good to the satisfaction of the Surveyor.

17. On completion of a survey or inspection, a Surveyor shall make his report and declaration as prescribed by the Marine Board.

18. On completion of an item or stage of an approved survey programme, the Surveyor shall sign the owner's copy, the vessel's copy and the Marine Board's copy of the programme documents, and shall also make a report to the Marine Board concerning the item or stage surveyed, and shall make a declaration concerning such report.

19. A Surveyor, when making a survey or inspection of a vessel shall be accompanied by the owner or his appointed representative.

#### C. Surveys & Inspections other than Initial & Periodic

20. Surveyors, or authorised persons, in the execution of their duties, may board any vessel at all reasonable times to make an occasional or random inspection.

21. The owner of a vessel shall report to the Marine Board any special factors which may influence the Marine Board's survey requirements for that vessel including any change of trade, operations and alterations to structure or machinery which have occurred since the previous survey. The Marine Board may require a Special survey to be conducted appropriate to that report.

22. The owner of a vessel shall make a report to the Marine Board as prescribed by the Marine Board concerning any accident or damage to the vessel or any death or injury to persons occurring on the vessel. Such report shall be forwarded to the Marine Board within 48 hours of such occurrence for a vessel in port, and, within 48 hours after the first arrival at a port, for a vessel at sea. Where any part of a vessel's hull, structure, machinery, fittings or equipment is open for routine maintenance or substantial repair then the owner shall inform the Marine Board so that a survey may take place at the Marine Board's discretion.

## PART 3—CERTIFICATE

**A. Issue of Certificate**

23. Upon the receipt of a satisfactory report and declaration of each Surveyor performing the Initial Survey of a vessel, the Marine Board shall prepare a Survey Certificate as prescribed by the Marine Board and Record of Survey describing the hull, machinery and equipment of the vessel.

24. The Survey Certificate shall include the following information:

Name of Vessel;  
 Identifying number of vessel;  
 Official Number (if registered vessel);  
 Assigned freeboard;  
 Number of Passengers;  
 Number of Crew;  
 Class of Vessel;  
 Limits of Operation(s);  
 Measured Length and/or Gross Tonnage;  
 Particulars of Main Propulsion;  
 Name of Master, and Certificate;  
 Name and Address of Owners;  
 Marine Board Seal;  
 Signature of authorised officer(s);  
 Period of Validity from ..... to .....;  
 Statement that vessel complies with the survey requirements of the Marine Board.

24.1 the period of Validity of the Certificate shall not exceed 6 months.

25. The original of the Survey Certificate shall be issued to the owner or his agent.

26. A vessel under survey to the Marine Board shall be required to carry evidence onboard that the vessel complies with the appropriate survey requirements of Marine Board.

26.1 this evidence shall consist of the display of the original or a copy of the Survey Certificate;

26.1 this evidence shall be displayed near the steering position, except on passenger vessels, where the evidence shall be displayed in such a position that it is readily visible to passengers;

26.3 if the Marine Board so requires, the evidence carried onboard the vessel shall be placed in such a position onboard that it shall be visible from outside the vessel.

27. The owner of a vessel shall not operate that vessel without the approval of the Marine Board unless:

27.1 a Survey Certificate has been issued for such vessel; and

27.2 evidence of compliance with the appropriate survey requirements of the Marine Board is displayed onboard.

28. If the Marine Board so requires upon the satisfactory completion of a cycle of an approved survey programme for a vessel and the receipt of the report and declaration of each Surveyor, the Marine Board may then issue for display on the vessel either:

28.1 a new copy of the evidence required to be carried on board under clause 26; or

28.2 a statement of revalidation, in a suitable form, that the evidence carried on the vessel under clause 26 shall remain valid until the new expiry date indicated, (which date shall usually be the due date of the completion of the following cycle of the approved survey programme).

29. On satisfactory completion of a cycle of a survey programme, the Marine Board may then issue to the owner the document referred to in sub-clause 28.1 or 28.2 as appropriate.

**B. Extension, Suspension, Cancellation**

30. Application for extension

30.1 the owner(s) of a vessel under survey by the Marine Board may apply in writing to the Marine Board for an extension of the Survey Certificate carried by the vessel in accordance with clause 25;

30.2 this application shall be accompanied by the appropriate fee, as determined by the Marine Board.

31. Terms of an extension.

31.1 in any case in which the Marine Board is satisfied that the immediate survey of a vessel is impracticable or would occasion unreasonable or unnecessary expense or inconvenience, the Marine Board may extend the time for re-survey for any period not exceeding one month. An extension may be granted notwithstanding that the Survey Certificate has expired;

31.2 the Marine Board may require an inspection and report on the condition of a vessel to be made before granting the extension of a Survey Certificate;

31.3 where the Marine Board grants an extension of the Survey Certificate it shall issue to the owner of the vessel a Notice of Extension.

32. Where the Marine Board is satisfied, by reason of a report that a vessel under its survey fails to comply, for any reason, with the appropriate survey requirements, that the Marine Board may suspend the Survey Certificate and the owner shall be advised accordingly. The owner when so advised, shall not operate the vessel without the approval of the Marine Board.

33. Where the Survey Certificate has been suspended or has expired or been cancelled, the Marine Board may require it and the evidence of survey to be delivered up as directed.

## PART 4—MISCELLANEOUS

34. For the purposes of control and co-ordinating of the survey or inspection of vessels holding Survey Certificates issued by the Marine Board it shall require the owner to advise the Marine Board within such period as may be required that:

- (a) a vessel has been sold and the name and address of a new owner;
- (b) the intention to withdraw the vessel from commercial operations;
- (c) the transfer of the vessel into the jurisdiction of another Authority for an extended period; or
- (d) any proposed alteration to the vessel of its manner of operation.



35. The Marine Board may accept the certificate issued by another Authority and dispense with the survey of that vessel during the current Validity of that certificate.

36. Where a vessel which is carrying out an approved survey programme proceeds to the jurisdiction of another Authority, the survey programme of that vessel may be continued subject to the approval of that Authority.

#### PART 5—SINGLE VOYAGE TOWAGE PERMIT

37. This Part applies to all vessels which are engaged in towing or being towed on a seagoing voyage.

38. This Part does not apply to:

38.1 regular towage of cargo on a commercial basis;

38.2 the harbour towage of vessels;

38.3 the towage/assistance of oil-exploration structures, semi-submersible oil platforms etc. which are self propelled;

38.4 a vessel in distress at sea or stranded in a position where immediate action by the towing vessel is vital to the saving of life and/or property.

39. The Marine Board shall require all vessels which are to be towed on a seagoing voyage to undergo an inspection to determine their fitness to be towed. Such vessels may only be towed on a seagoing voyage after the Marine Board shall have issued a "Towage Permit" as prescribed by the Marine Board.

40. The owner of a vessel intended to be towed shall forward to the Marine Board an "Application for Towage Permit" as prescribed by the Marine Board, together with the appropriate survey fee.

41. An "Application for Towage Permit" shall be accompanied by the following necessary information regarding the vessel to be towed:

41.1 nature of tow (e.g. ferry, cargo ship, unloaded barge etc);

41.2 name, official number and port of registry;

41.3. details of any current certificates relating to the tow;

41.4 point of departure and destination of tow;

41.5 details of towing operation i.e. manning (if any) estimated departure date, estimated towing speed, duration of operation;

41.6 such other information as the Marine Board may require.

42. The owner of the vessel to be towed, the owner, master or agent of the towing vessel shall be required to forward the following information to the Marine Board regarding the towing vessel:

42.1 name, official number, and port of registry;

42.2 type of vessel;

42.3 details of any current certificate relating to the towing vessel;

42.4 propulsion power and or bollard pull; and

42.5 any such other information as the Marine Board may require.

43. In general due consideration should be given to the following main aspects when inspecting a vessel for fitness to be towed:

43.1 the structural condition of the hull, taking into account the intended voyage;

43.2 the prevention of water entering the hull, by the provision of adequate means of closing all openings;

43.3 the stability in the towed condition;

43.4 the towing arrangements; and

43.5 to ensure compliance with the Collision Regulations.

#### Appendix I

#### ITEMISED SURVEY LIST

#### PART 1—SEMI-ANNUAL SIGHT SURVEYS

The following items shall be inspected while the vessel is afloat to ensure that the standards required of the Annual Survey are being satisfactorily maintained.

1. Safety Equipment as listed in Part 2.
2. Running trial of each main engine and associated gear box.
3. Operational test of bilge pumps, alarms and bilge valves.
4. Operational test of all valves in the Fire Main System.
5. Running trial of all machinery essential to the safe operation of the vessel.
6. Inspection of pipe arrangements.
7. Inspection of escapes from engine room and accommodation spaces.
8. Inspection of personal protection arrangements in machinery spaces.
9. Inspection of casings, superstructure, skylights, hatchways, companionways, bulwarks and guard rails, ventilators and air pipes together with all closing devices.

#### ANNUAL SURVEYS

*(Additional to Semi-Annual Sight Surveys)*

10. Operational test of all sea injections and overboard discharge valves and cocks.
11. Operational test of main and emergency means of steering.
12. General examination of machinery installation and electrical installation.
13. All safety and relief valves associated with the safe operation of the vessel to be set at the required working pressure.
14. Pressure vessels, and associated fittings used for the generation of steam pressure or the heating of water to a temperature exceeding 99 degrees (C).
15. Inspection of liquified petroleum gas installation.
16. Inspection of cargo handling machinery.

17. Pressure vessel and associated fittings of an air pressure/salt water having a working pressure of more than 274 kPa.
18. A boiler and its mountings and fittings.  
*(Steel vessels of less than 24 years age may extend items 19 to 22 to Two year surveys subject the results of a Diver's Survey report.)*
19. Hull externally and internally except in way of tanks forming part of the structure.
20. Sea injection and overboard discharge valves and cocks.
21. Inspection of propellers, rudders and underwater fittings.
22. Inspection of ground tackle.

#### FOUR YEARLY SURVEY

1. Each propeller, shaft and tube.
2. All shipside valves opened up.
3. Each rudder and stock bearing.
4. Steering gear.
5. Windlass.
6. Compressed air pressure vessels having a working pressure of more than 275 kPa and associated fittings.
7. Pressure vessel and associated fittings of an air pressure/fresh water system having a working pressure of more than 275 kPa.
8. Insulation tests of all electrical installations above 32V, A.C. or D.C.
9. Anchors and Cables to range and calibrate.
10. Chain locker internally.
11. Tanks forming part of the hull other than fuel oil tanks, internally.
12. One third of all fuel oil tanks forming part of the hull, internally, so that all such tanks are inspected within a twelve year period.
13. Void spaces internally.
14. Hull in way of removeable ballast.
15. Selected sections of internal structure in way of refrigerated space.
16. Hull thickness gauging for vessels over 15 years old.
17. Cargo handling gear, load tested.
18. The survey period for an item not specified in this part shall be that period determined by the Fiji Marine Board.

In respect of pressure vessels, boilers and cargo handling gear, the Surveyor may accept valid Certificates issued by an Inspector authorised by and in compliance with The Factories Act 1971.

#### PART 2—SAFETY EQUIPMENT SURVEY

1. Approved boats, equipment and launching arrangements.
2. Inflatable liferafts and Buoyant Apparatus. Certificates of Servicing and launching arrangements, cradles and hydrostatic releases.
3. Buoyant Appliances.
4. Internal buoyancy in small vessels.
5. Lifebuoys, self-igniting lights, smoke signals and buoyant lines.
6. Lifejackets and attachments-buoyancy check if required.
7. Portable Radio Equipment Certificate.
8. Line Throwing Appliance. Expiry date of rockets.
9. Pyrotechnic Distress Signals. Expiry date.
10. Rescue Signals Table.
11. Chronometer, watches, bridge clock.
12. Compasses, Deviation Card.
13. Depth Sounder.
14. Signalling equipment.
15. Charts and Nautical Publications.
16. Accommodation ladders, Gangways and Safety nets.
17. Electronic Nav aids.
18. Anchors and Cables—windlass operation and securing equipment.
19. Pilot Ladders.
20. Medicines and Medical Stores.
21. Official Log Book. Accident reports, Emergency drills.
22. Navigation Lights, shapes and Sound Signals.
23. Fire Detection System—test.
24. Fire pumps hydrants and hoses.
25. Emergency fire pump.
26. Fixed fire extinguishing installations. Certificate of Servicing.
27. Fire extinguishers. Certificate of Servicing.
28. Firemans Outfit—safety lamp. Cylinders contents of breathing apparatus.
29. International Shore Connection.
30. Firebuckets.
31. Sand trays.
32. Alarm bells.
33. Public Address System.
34. Remote Va

35. Emergency Lighting.
36. Stability information.
37. Cargo gear. Visual inspection, Sight Certificates' Validity.
38. Validity of Classification Society Certificates as appropriate.
39. Notice Board for correct display of Survey/Safety Certificates.

## Appendix II

## LIST OF APPROVED CLASSIFICATION SOCIETIES

1. Valid certificates of survey issued by the Societies listed below will be accepted by the Marine Board:

American Bureau of Shipping  
 Bureau Veritas  
 Det Norske Veritas  
 Lloyds  
 Nippon Kaiji Kyokai

## Appendix III

## SURVEY FORMS

Form SUR1	Application for Survey
Form SUR2	Report of Survey & Surveyors Declaration
Form SUR3	Survey Certificate
Form SUR4	Revalidation of Survey Certificate
Form SUR5	Application for Extension of Survey Certificate
Form SUR6	Extension of Survey Certificate
Form SUR7	Notice of Expiry of Survey Certificate
Form SUR8	Notice of Suspension/Cancellation
Form SUR10	Application for Towage Permit
Form SUR11	Towage Permit

## APPLICATION FOR SURVEY

(Marine Act, 1986)

FII  
MARINE  
BOARD

## PARTICULARS OF VESSEL

Name: \_\_\_\_\_

Type of Survey: Equipment only, Initial, Sight, Annual, 4 year, Special

Length: \_\_\_\_\_

Gross Tons: \_\_\_\_\_

KW : \_\_\_\_\_

Passengers: Intended number) -- 40 =

Locality of vessel \_\_\_\_\_

Date &amp; Time for Survey: \_\_\_\_\_

Date &amp; Time vessel entering slipway: \_\_\_\_\_

Basic fees paid: \_\_\_\_\_

FOR OFFICIAL USE ONLY	
\$ ..	
\$ ..	
\$ ..	
\$ ..	
\$ ..	
TOT.	
RR/No.	

Secretary, Fiji Marine Board

## NOTES:

1. At least 24 hours written notice is required for attendance of a Surveyor.
2. Vessel must not be unslipped without Hull Surveyors authority.
3. Additional charges may be incurred due to overtime working, or delays beyond the control of the Surveyor. Such costs must be paid by the shipowner before a Survey Certificate will be issued. To prevent this causing undue delays to a vessel the owner may request an "Interim Survey Certificate" of 2 weeks duration to be issued as soon as the Surveyors Declaration is signed.
4. For Initial Surveys only, state:
  - 4.1 Type and purpose of vessel: \_\_\_\_\_
  - 4.2 Intended area of operation: \_\_\_\_\_
  - 4.3 If vessel to be in class, the Society: \_\_\_\_\_
  - 4.4 Attach any Certificates of Tonnage, Class, Loadline, and ship's plans.

I hereby apply for a Survey to be conducted.

Date: \_\_\_\_\_

Owner/Agent

## REPORT OF SURVEY

FIJI  
MARINE  
BOARD

For the purposes  
of the Marine Act 1986

Present Survey	Initial 4:	Annual Special
NEXT PERIODICAL SURVEY DUE:		
Annual:		/19
On slip:		/19
4 year:		/19

## PARTICULARS OF SHIP

Name & Official Number	Port of Registry	Gross Tonnage	Date of Build	Master and Certificate
Owner's Name & Address	Length	Breadth	Length Overall	Freeboard
Type of Machinery & KW	Endorsements:			

## LIFESAVING APPLIANCES

Life-buoys	Life jackets	Approved Boats	Inflatable	Rigid Buoyant Apparatus				
Passengers Accommodated IN/ON	Harbour & River		Short Coasting		Fiji Islands		Pacific Region	Unlimited
	Day	Night	Day	Night	Day	Night		
Approved Berths:								
Unberthed/Hatch:								
Unberthed/Other:								
Total Passengers:								
Crew:								
Total:								

## SURVEYORS DECLARATION

The details described in this document were inspected commencing on the \_\_\_\_\_ to \_\_\_\_\_ 19 \_\_\_\_\_ and found to be in accordance with the requirements of the Marine Act and Rules and Regulations made there-under.

Date of completing Survey: \_\_\_\_\_ 19 \_\_\_\_\_ Marine Survey Office: \_\_\_\_\_  
Name: \_\_\_\_\_ (Surveyor(s)) Signed: \_\_\_\_\_

## MARINE ACT

FIJI  
MARINE  
BOARD  
(Official Seal)

SURVEY CERTIFICATE  
(No. \_\_\_\_\_ 19 \_\_\_\_\_)

Of the \_\_\_\_\_ (Class) \_\_\_\_\_ Gross Tons: \_\_\_\_\_ Net Tons: \_\_\_\_\_ No: \_\_\_\_\_  
DIMENSIONS— PARTICULARS OF MAIN PROPULSION  
Length: \_\_\_\_\_ Make: \_\_\_\_\_  
Breadth: \_\_\_\_\_ Type: \_\_\_\_\_  
Assigned Freeboard \_\_\_\_\_ Power (KW) \_\_\_\_\_  
Name of Master: \_\_\_\_\_ Certificate Grade: \_\_\_\_\_ No.: \_\_\_\_\_  
Name & Address of Owners: \_\_\_\_\_ of \_\_\_\_\_  
Endorsement: \_\_\_\_\_

Passengers Accommodated IN/ON	Harbour & River		Short Coasting		Fiji Islands		Pacific Region	Unlimited
	Day	Night	Day	Night	Day	Night		
Approved Berth								
Unberthed/Hatch								
Unberthed/Other								
Total Passengers:								
Crew:								
Total:								

## LIFESAVING APPLIANCES

Life buoys	Life jackets	Approved Boats	Inflatable	Rigid Buoyant Apparatus



## APPLICATION FOR EXTENSION OF CERTIFICATE OF SURVEY

FIJI  
MARINE  
BOARD

To \_\_\_\_\_

Name of Vessel: \_\_\_\_\_

Registered or Identifying No. of Vessel: \_\_\_\_\_

Port of Registry: \_\_\_\_\_

Type of Vessel: \_\_\_\_\_

## DECLARATION PRIOR TO THE EXTENSION OF A CERTIFICATE

I/We, the undersigned, hereby declare that the above vessel has not been subject to any accident or other occurrence which would raise any doubt as to the vessel continuing to be seaworthy and properly equipped to operate in the limits prescribed by the Survey Certificate, and that there is not, to my/our best knowledge, any reason why an extension, as permitted under the Marine Act, should not be granted.

Signed at: \_\_\_\_\_ this \_\_\_\_\_ day of \_\_\_\_\_ 19 \_\_\_\_\_

\_\_\_\_\_ Master

\_\_\_\_\_ Owner

FORM SUR6

## MARINE ACT

FIJI  
MARINE BOARD  
(Seal)

EXTENSION OF CERTIFICATE OF SURVEY

Name of Vessel: \_\_\_\_\_

Registered or Identifying No. of Vessel: \_\_\_\_\_

Port of Registry: \_\_\_\_\_

Class of Vessel: \_\_\_\_\_

Under Section 94 of the Marine Act, 1986 the currency of this Certificate is extended for a period not exceeding: \_\_\_\_\_ month(s) from the expiration date of the Certificate.

Port: \_\_\_\_\_ Signed: \_\_\_\_\_

President, FIJI MARINE BOARD

Date: \_\_\_\_\_

THIS DOCUMENT IS TO BE ATTACHED TO THE  
CERTIFICATE OF SURVEY

FIJI  
MARINE BOARD

NOTICE OF EXPIRY OF SURVEY CERTIFICATE

Name of Vessel: \_\_\_\_\_

Port of Registry: \_\_\_\_\_

Registered No. of Vessel: \_\_\_\_\_

Under Section 67 of the Marine Act, 1986, you: \_\_\_\_\_ owner of the above vessel are hereby reminded that the Survey Certificate of the vessel expires on: \_\_\_\_\_ Type of Survey due: \_\_\_\_\_

If no application for extension of the above Survey Certificate or no application of survey is received by the Marine Board before such date, the vessel will be declared "out of survey" and shall not be taken to sea or remain at sea.

Issued at \_\_\_\_\_ this \_\_\_\_\_ day of \_\_\_\_\_ 19 \_\_\_\_\_

\_\_\_\_\_ (Secretary)

FORM SUR8

## MARINE ACT

FIJI  
MARINE BOARD

NOTICE OF SUSPENSION/CANCELLATION

Name of Vessel: \_\_\_\_\_

Port of Registry: \_\_\_\_\_

Registered No. of Vessel: \_\_\_\_\_

Under Section 68 of the Marine Act, 1986, you: \_\_\_\_\_ owner of the above vessel are hereby advised that:

- \*The Validity of the Survey Certificate of the vessel is suspended until such time that the vessel is again reported to comply with survey requirements.
- \*The Survey Certificate of the vessel is cancelled.

Issued at \_\_\_\_\_ this \_\_\_\_\_ day of \_\_\_\_\_ 19 \_\_\_\_\_

\*Indicated which term is applicable \_\_\_\_\_ (Secretary)

FIJI  
MARINE  
BOARD

## MARINE ACT

## REPORT OF ACCIDENT OR OTHER OCCURRENCE

To: Secretary, Fiji Marine Board.

## PARTICULARS OF VESSEL

Name of Vessel: \_\_\_\_\_ Registered No. of Vessel \_\_\_\_\_  
 Port of Registry: \_\_\_\_\_ Measured Length: \_\_\_\_\_  
 If Vessel classed \_\_\_\_\_  
 Name of Society: \_\_\_\_\_  
 Name & Address of Owner (s): \_\_\_\_\_  
 Date of Occurrence: \_\_\_\_\_ Place of Occurrence: \_\_\_\_\_  
 Number of Persons onboard: \_\_\_\_\_ Crew: \_\_\_\_\_ Passengers on a voyage  
 from: \_\_\_\_\_ to: \_\_\_\_\_  
 Master's Name: \_\_\_\_\_  
 Master's Address: \_\_\_\_\_  
 Weather Conditions: \_\_\_\_\_

NATURE AND PARTICULARS OF ACCIDENT OR  
OTHER OCCURRENCE

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Date: \_\_\_\_\_ (Master)

## APPLICATION FOR TOWAGE PERMIT

FIJI  
MARINE  
BOARD

To: \_\_\_\_\_

## PARTICULARS OF VESSEL TO BE TOWED

Name and Port of Registry: \_\_\_\_\_  
 Registered or Identifying No.: \_\_\_\_\_  
 Type of Vessel: \_\_\_\_\_  
 Name & Address of Owners \_\_\_\_\_  
 Details of any Certificates in Force: \_\_\_\_\_  
 Place, Date and Time where vessel will be available for  
 inspection: \_\_\_\_\_  
 Date when vessel last slipped: \_\_\_\_\_

## PARTICULARS OF TOWING VESSEL

Name and Port of Registry: \_\_\_\_\_  
 Type of Vessel: \_\_\_\_\_  
 Name and Address of Owners: \_\_\_\_\_  
 Details of any Certificate in Force: \_\_\_\_\_  
 Propulsion power or bollard pull: \_\_\_\_\_

## DETAILS OF TOW

Point of Departure, Date & Time: \_\_\_\_\_  
 Destination: \_\_\_\_\_  
 Estimated Towing Speed: \_\_\_\_\_ Estimated Date of Arrival \_\_\_\_\_  
 Manning: \_\_\_\_\_  
 \_\_\_\_\_ (Owner) \_\_\_\_\_ (Date)

## OFFICE USE ONLY

Date Application Received \_\_\_\_\_ Fee Received: \_\_\_\_\_  
 Date of Inspection: \_\_\_\_\_  
 Surveyors Report Received: \_\_\_\_\_  
 Date Towage Permit Issued: \_\_\_\_\_  
 Conditions: \_\_\_\_\_  
 Date Tow Departed: \_\_\_\_\_  
 Date Tow Arrived: \_\_\_\_\_

## MARINE ACT

FORM SUR11

FIJI  
MARINE  
BOARD  
SEAL

## TOWAGE PERMIT

Name of Vessel &amp; Port of Registry: \_\_\_\_\_

Registered or Identifying No.: \_\_\_\_\_

Type of vessel: \_\_\_\_\_

Name & Address of Owner(s): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_Details of Certificates in Force: \_\_\_\_\_  
\_\_\_\_\_

This is to certify that the vessel is permitted to be towed a sea-going voyage  
from: \_\_\_\_\_ to: \_\_\_\_\_

by the vessel: \_\_\_\_\_ departing on or about: \_\_\_\_\_

and arriving on or about: \_\_\_\_\_

subject to the following conditions.

Date: \_\_\_\_\_ (President)

## APPENDIX IV

## SAFETY CONVENTION CERTIFICATE FORMS

The following are the Forms of Safety Certificates to be used in respect of Safety  
Convention Ships:

- FORM SUR12 PASSENGER SHIP SAFETY CERTIFICATE
- FORM SUR13 CARGO SHIP SAFETY CONSTRUCTION CERTIFICATE
- FORM SUR14 SUPPLEMENT TO THE CARGO SHIP SAFETY CON-  
STRUCTION CERTIFICATE
- FORM SUR15 CARGO SHIP SAFETY EQUIPMENT CERTIFICATE
- FORM SUR16 SUPPLEMENT TO THE CARGO SHIP SAFETY EQUIP-  
MENT CERTIFICATE
- FORM SUR17 CARGO SHIP SAFETY RADIO TELEGRAPH CERTIFI-  
CATE
- FORM SUR18 CARGO SHIP SAFETY RADIO TELEPHONY CERTIFI-  
CATE
- FORM SUR19 EXEMPTION CERTIFICATE



PASSENGER SHIP SAFETY CERTIFICATE FORM SUR12

FIJI  
MARINE  
BOARD  
(OFFICIAL  
SEAL)

(FIJI)

for an international voyage  
a short

Issued under the provisions of the  
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA,  
1974

Name of ship	Distinctive number or letters	Port of registry	Gross tonnage	Particulars of voyages, if any, sanctioned under regulation 27(c) (vii) of chapter III*	Date on which keel was laid (see NOTE below)

The Fiji Marine Board Certifies

I. That the above-mentioned ship has been duly surveyed in accordance with the provisions of the Convention referred to above.

II. That the survey showed that the ship complied with the requirements of the regulations annexed to the said Convention as regards:

- (1) the structure, main and auxiliary boilers and other pressure vessels and machinery;
- (2) the watertight subdivision arrangements and details;
- (3) the following subdivision load lines:

\* Regulation III/20.1.2 of the 1983 SOLAS amendments.

FORM SUR 12 (cont'd)

Subdivision load lines assigned and marked on the ship's side at amidships (regulation 11 of chapter 11-1)*	Freeboard	To apply when the spaces in which passengers are carried include the following alternative spaces
C.1	....	....
C.2	....	....
C.3	....	....

III. That the Life-saving appliances provide for a total number of..... persons and no more, viz.:

- .... lifeboats (including... motor lifeboats) capable of accommodating..... persons, and ..... motor lifeboats fitted with radiotelegraph installation and searchlight (included in the total lifeboats shown above) and .... motor lifeboats fitted with search light only (also included in the total lifeboats shown above), requiring ..... certificated lifeboatmen;
- .... liferafts, for which approved launching devices are required, capable of accommodating .... persons; and
- .... liferafts, for which approved launching devices are not required, capable of accommodating ... persons;
- .... buoyant apparatus capable of supporting.... persons;
- .... lifebuoys;
- .... lifejackets.

IV. That the lifeboats and liferafts were equipped in accordance with the provisions of the regulations.

V. That the ship was provided with a line-throwing appliance and portable radio apparatus for survival craft in accordance with the provisions of the regulations.

VI. That the ship complied with the requirements of the regulations as regards radiotelegraph installations, viz.:

	Requirements of regulations	Actual provision
Hours of listening by operator.....	_____	_____
Number of operators:.....	_____	_____
Whether auto alarm fitted:.....	_____	_____
Whether main installation fitted.....	_____	_____
Whether reserve installation fitted.....	_____	_____
Whether main and reserve transmitters electrically separated or combined.....	_____	_____
Whether direction-finder fitted.....	_____	_____
Whether radio equipment for homing on the radiotelephone distress frequency fitted.....	_____	_____
Whether radar fitted.....	_____	_____
Number of passengers for which certificated.....	_____	_____

\*Regulation -1/13 of the 1981 and 1983 SOLAS amendments.

## FORM SUR 12 (cont'd)

VII. That the functioning of the radiotelegraph installations for motor lifeboats and/or the portable radio apparatus survival craft, if provided, complied with the provisions of the regulations.

VIII. That the ship complied with the requirements of the regulations as regards fire-detecting and fire-extinguishing appliances, radar, echo-sounding device and gyro-compass and was provided with navigation lights and shapes, pilot ladder, and means of making sound signals, and distress signals in accordance with the provisions of the regulations and also the International Regulations for Preventing Collisions at Sea in force.

IX. That in all other respects the ship complied with the requirements of the regulations, so far as these requirements apply thereto.

This certificate is issued under the authority of the Fiji Government. It will remain in force until \_\_\_\_\_

Issued at \_\_\_\_\_ the \_\_\_\_\_ day of \_\_\_\_\_ 19\_\_\_\_\_

(Seal)

The undersigned declares that he is duly authorized by the said Government to issue this Certificate.

\_\_\_\_\_  
(Signature)  
President, FIJI MARINE BOARD

NOTE: It will be sufficient to indicate the year in which the keel was laid or when the ship was at a similar stage of construction except for 1952, 1965, 1981, 1984 and 1986, in which cases the actual date should be given.

In the case of a ship which is converted as provided in regulation 1(b)(i) of chapter II-1\* or regulation 1(a)(i) of chapter II-2\*\* of the Convention, the date on which the work of conversion was begun should be given.

\* Regulation II-1/1.1.3.3 of the 1981 and 1983 SOLAS amendments.

\*\* Regulation ii-2/1.1.3.3 of the 1981 and 1983 SOLAS amendments.

## FORM SUR13

## CARGO SHIP SAFETY CONSTRUCTION

MARINE  
BOARD  
(Official  
Seal)

(FIJI)

Issue under the provisions of the  
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE  
AT SEA, 1974

Name of Ship	Distinctive Number or Letters	Port of Registry	Gross Tonnage	Date on which keel was laid (see NOTE below)

The Fiji Marine Board Certifies

That the above-mentioned ship has been duly surveyed in accordance with the provisions of Regulation 10 of Chapter I of the Convention referred to above, and that the survey showed that the condition of the hull, machinery and equipment, as defined in the above Regulation, was in all respect satisfactory and that the ship complied with the applicable requirements of Chapter II-1 and Chapter II-2 (other than that relating to fire-extinguishing appliances and fire control plans).

This certificate is issued under the authority of the Fiji Government. It will remain in force until: \_\_\_\_\_

Issued at \_\_\_\_\_ the \_\_\_\_\_ day of \_\_\_\_\_ 19\_\_\_\_\_

(Seal)

The undersigned declares that he is duly authorised by the said Government to issue this Certificate.

\_\_\_\_\_  
President, FIJI MARINE BOARD

**SUPPLEMENT TO THE CARGO SHIP SAFETY  
CONSTRUCTION CERTIFICATE**

**FIJI  
MARINE  
BOARD**

**FIJI**

Issued under the provisions of the  
**PROTOCOL OF 1978 RELATING TO THE INTERNATIONAL  
CONVENTION FOR THE SAFETY OF LIFE AT SEA 1974**

Name of Ship	Distinctive number of letters	Port of registry	Deadweight of ship (metric tons)	Year of build

Type of ship:

- Tanker engaged in the trade carrying crude oil\*
- Tanker engaged in the trade carrying oil other than crude oil\*
- Tanker engaged in the trade of carrying crude/other oil\*
- Cargo ship other than a tanker engaged in the trade of carrying oil\*

Date of contract for building or alteration or modification of a major character\*\* \_\_\_\_\_

Date on which keel was laid or ship was at a similar stage of construction or on which an alteration or modification of a major character was commenced\*\* \_\_\_\_\_

Date of delivery or completion of an alteration or modification of a major character\*\* \_\_\_\_\_

This Supplement shall be permanently attached to the Cargo Ship Safety Construction Certificate.

\* Delete as appropriate.

\*\* When the date of the building contract is known, this should be recorded, a dash (-) entered in the space for the keel-laying date and the date also recorded.

When the date of the building contract is not known, a dash(-) should be entered in the space for this date and the keel-laying and delivery dates recorded.

Whether a ship is "new" or "existing" would than be decided on the basis of the above dates (PSLS.2/Circ.8).

**THIS IS TO CERTIFY;**

That the ship has been surveyed in accordance with regulation 10 of chapter I of the Protocol of 1978 Relating to the International Convention for the Safety of Life at Sea, 1974; and

that the survey showed that the condition of the hull, machinery and equipment as defined in the above regulation was in all respects satisfactory and that the ship complied with the requirements of that Protocol.

This certificate is valid until \_\_\_\_\_  
subject to intermediate survey(s) at intervals of \_\_\_\_\_

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

\_\_\_\_\_ 19 \_\_\_\_\_

\_\_\_\_\_  
President, FIJI MARINE BOARD

**FIJI  
MARINE  
BOARD  
(SEAL)**

Intermediate survey

This is to certify that at an intermediate survey required by regulation 10 of chapter I of the Protocol of 1978 Relating to the International Convention for the Safety of Life at Sea, 1974, this ship was found to comply with the relevant provisions of that Protocol.

Signed: \_\_\_\_\_ President, Fiji Marine Board

Place: \_\_\_\_\_

Date: \_\_\_\_\_

Next intermediate survey due: \_\_\_\_\_

(Seal or stamp of the Board)

Signed \_\_\_\_\_ President, Fiji Marine Board

Place \_\_\_\_\_

Date \_\_\_\_\_

FORM SUR14 (cont'd)

Next intermediate survey due \_\_\_\_\_

(Seal or stamp of the Board)

Signed \_\_\_\_\_

President, Fiji Marine Board

Place \_\_\_\_\_

Date \_\_\_\_\_

Next intermediate survey due \_\_\_\_\_

(Seal or stamp of the Board)

Signed \_\_\_\_\_

President, Fiji Marine Board

Place \_\_\_\_\_

Date \_\_\_\_\_

(Seal or stamp of the Board)

FORM SUR15

CARGO SHIP SAFETY EQUIPMENT CERTIFICATE

FIJI  
MARINE  
BOARD  
(Official  
Seal)

(FIJI)

Issued under the provisions of the  
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT  
SEA, 1974

Name of ship	Distinctive Number or Letters	Port of Registry	Gross Tonnage	Date on which keel was laid (see NOTE below)

The Fiji Marine Board Certifies

I. That the above-mentioned ship has been duly inspected in accordance with the provisions of the Convention referred to above.

II. That the inspection showed that the life-saving appliances provided for a total number of \_\_\_\_\_ persons and no more viz.

- \_\_\_\_\_ life boats on port side capable of accommodating \_\_\_\_\_ persons;
- \_\_\_\_\_ lifeboats on starboard side capable of accommodating \_\_\_\_\_ persons;
- \_\_\_\_\_ motor lifeboats (included in the total lifeboats shown above), including \_\_\_\_\_ motor lifeboats fitted with radiotelegraph installation and searchlight, and \_\_\_\_\_ motor lifeboats fitted with searchlight only;
- \_\_\_\_\_ liferafts, for which approved launching devices are required, capable of accommodating \_\_\_\_\_ persons; and
- \_\_\_\_\_ liferafts, for which approved launching devices are not required, capable of accommodating \_\_\_\_\_ persons;
- \_\_\_\_\_ lifebuoys;
- \_\_\_\_\_ life-jackets.

III. That the lifeboats and liferafts were equipped in accordance with the provisions of the Regulations annexed to the Convention.

IV. That the ship was provided with a line-throwing apparatus and portable radio apparatus for survival craft in accordance with the provisions of the Regulations.

V. That the inspection showed that the ship complied with the requirements of the said Convention as regards fire-extinguishing appliances and fire control plans, echo-sounding device and gyro-compass and was provided with navigation lights and shapes, pilot ladder, and means of making sound signals and distress signals, in accordance with the provisions of the regulations and the International Regulations for Preventing Collisions at Sea in force.

VI. That in all other respects the ship complied with the requirements of the regulations so far as these requirements apply thereto.

This certificate is issued under the authority of the Fiji Government. It will remain in force until \_\_\_\_\_

Issued at \_\_\_\_\_ the \_\_\_\_\_ day of \_\_\_\_\_ 19 \_\_\_\_\_

(Seal)

The undersigned declares that he is duly authorised by the said Government to issue this certificate.

\_\_\_\_\_  
President, FIJI MARINE BOARD

Note: It will be sufficient to indicate the year in which the keel was laid or when the ship was at a similar stage of construction except for 1952, 1965, 1980, 1984 and 1986, in which cases the actual date should be given.

FORM SUR16

SUPPLEMENT TO THE CARGO SHIP SAFETY  
EQUIPMENT CERTIFICATE

FIJI  
MARINE  
BOARD

(FIJI)

Issued under the provisions of the  
PROTOCOL OF 1978 RELATING TO THE INTERNATIONAL  
CONVENTION FOR THE SAFETY OF LIFE AT SEA 1974

Name of Ship	Distinctive number or letters	Port of registry	Deadweight of ship (metric tons)	Year of build

Type of Ship:

- Tanker engaged in the trade of carrying crude oil\*
- Tanker engaged in the trade carrying oil other than crude oil\*
- Tanker engaged in the trade of carrying crude/other oil\*
- Cargo ship other than a tanker engaged in the trade of carrying oil\*

Date of contract for building or alteration or modification of a major character\*\* \_\_\_\_\_

Date on which keel was laid or ship was at a similar stage of construction or on which an alteration or modification of a major character was commenced\*\* \_\_\_\_\_

Date of delivery or completion of an alteration or modification of a major character\*\* \_\_\_\_\_

This Supplement shall be permanently attached to the Cargo Ship Safety Equipment Certificate.

\* Delete as appropriate.

FORM SUR16 (cont'd)

\*\* When the date of the building is known, this should be recorded, a dash (-) entered in the space for the keel-laying date and the delivery date also recorded.

When the date of the building contract is not known, a dash(-) should be entered in the space for this date and the keel-laying and delivery dates recorded.

Whether a ship is "new" or "existing" would than be decided on the basis of the above dates (PSLS.2/Cir.8).

This is to Certify:

That the ship has been surveyed in accordance with regulation 8 of chapter I of the Protocol of 1978 Relating to the International Convention for the Safety of Life at Sea, 1974; and

that the survey showed that the condition of the safety equipment as defined in the above regulation was in all respects satisfactory and that the ship complied with the requirements of that Protocol.

This certificate is valid until \_\_\_\_\_ subject \_\_\_\_\_ to intermediate survey(s) at intervals of \_\_\_\_\_

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

\_\_\_\_\_ 19 \_\_\_\_\_

\_\_\_\_\_  
President, FIJI MARINE BOARD

MARINE  
BOARD  
(SEAL)

CARGO SHIP SAFETY RADIOTELEGRAPHY CERTIFICATE

FJI  
MARINE  
BOARD  
(Official  
Seal)

(FJI)

Issued under the provisions of the  
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE  
AT SEA, 1974

Name of Ship	Distinctive Number or Letters	Port of Registry	Gross Tonnage	Date on which keel was laid (see NOTE below)

The Fiji Marine Board Certifies

I. That the above-mentioned ship complies with the provisions of the regulations annexed to the Convention referred to above as regards radiotelegraphy and radar:

	Requirements of regulations	Actual provision
Hours of listening by operator _____	_____	_____
Number of operators _____	_____	_____
Whether auto alarm fitted _____	_____	_____
Whether reserve installation fitted _____	_____	_____
Whether main and reserve transmitters electrically separated or combined _____	_____	_____
Whether direction-finder fitter _____	_____	_____
Whether radio equipment for homing on the radiotelephone distress frequency fitted _____	_____	_____
Whether radar fitted _____	_____	_____

II. That the functioning of the radiotelegraph installation for motor lifeboats and/or the portable radio apparatus for survival craft, if provided, complies with the provisions of the said regulations.

This certificate is issued under the authority of the Fiji Government. It will remain in force until \_\_\_\_\_

Issued at \_\_\_\_\_ the \_\_\_\_\_ day of \_\_\_\_\_ 19 \_\_\_\_\_  
(Seal)

The undersigned declares that he is duly authorized by the said Government to issue this certificate.

\_\_\_\_\_  
President, FIJI MARINE BOARD

CARGO SHIP SAFETY RADIOTELEPHONY CERTIFICATE

FJI  
MARINE  
BOARD  
(Official  
Seal)

(FJI)

Issued under the provisions of the  
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE  
AT SEA, 1974

Name of Ship	Distinctive Number or Letters	Port of Registry	Gross Tonnage	Date on which keel was laid (see Note below)

## The Fiji Marine Board Certifies

I. That the above-mentioned ship complies with the provisions of the Regulations annexed to the Convention referred to above as regards Radiotelephone:

	Requirements of Regulations	Actual provision
Hours of listening _____	_____	_____
Number of operators _____	_____	_____

II. That the functioning of the portable radio for survival craft, if provided, complies with the provisions of the said Regulations.

This certificate is issued under the authority of the Fiji Government. It will remain in force until \_\_\_\_\_

Issued at \_\_\_\_\_ the \_\_\_\_\_ day of \_\_\_\_\_ 19 \_\_\_\_\_

(Seal)

The undersigned declares that he is duly authorized by the said Government to issue this certificate.

\_\_\_\_\_  
President, FIJI MARINE BOARD

FORM SUR19

## EXEMPTION CERTIFICATE

FIJI  
MARINE  
BOARD  
(Official  
Seal)

(FIJI)

Issued under the provisions of the  
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE  
AT SEA, 1974

Name of Ship	Distinctive number or letters	Port of registry	Gross Tonnage

## The Fiji Marine Board Certifies

That the above-mentioned ship is, under the authority conferred by regulation \_\_\_\_\_ of chapter \_\_\_\_\_ of the regulations annexed to the Convention referred to above, exempted from the requirements of + \_\_\_\_\_ of the Convention on the voyages \_\_\_\_\_ to \_\_\_\_\_

\* Insert here the conditions, if any \* on which the exemption certificate is granted.

This certificate is issued under the authority of the Fiji Government. It will remain in force until \_\_\_\_\_

Issued at \_\_\_\_\_ the \_\_\_\_\_ day of \_\_\_\_\_ 19 \_\_\_\_\_

(Seal)

The undersigned declares that he is duly authorized by the said Government to issue this certificate.

\_\_\_\_\_  
(President, FIJI MARINE BOARD)

+ Insert here references to chapters and regulations, specifying particular paragraphs.

## SECTION 15

EMERGENCY PROCEDURES AND SAFETY OF NAVIGATION  
CONTENTS

PART I	:	PRELIMINARY
PART II	:	EMERGENCY PROCEDURES
APPENDIX A	:	EMERGENCY STATION LIST
APPENDIX B	:	SURVIVAL CRAFT LIST
SCHEDULES I	:	CREW EMERGENCY PRACTICE PROCEDURES
II	:	SURVIVAL CRAFT DRILLS
III	:	CREW FIRE DRILL
IV	:	CREW COLLISION DRILL
PART III	:	SAFETY OF NAVIGATION

## EMERGENCY PROCEDURES AND SAFETY OF NAVIGATION SECTION

## PART I—PRELIMINARY

## 1. Preliminary

1.1 This Section shall be read in conjunction with the Introduction, Definitions and General Requirements Sections.

1.2 For the purposes of this Section "crew" includes special personnel.

1.3 The Fiji Marine Board may require that a notice required under this Section shall be printed in other languages, in addition to the English language.

## PART II—EMERGENCY PROCEDURES

## 2. Application

2.1 This Part shall apply to all vessels other than Safety Convention Ships which shall comply with the SOLAS Convention, and vessels less than 10 metres length.

2.2 Where the Master is the only crew member, he shall not be subject to the requirements of Schedules I to IV for the crew provided that he shall ensure that the lifesaving, firefighting and other emergency equipment is in working order and ready for immediate use at all times.

2.3 The Fiji Marine Board may modify the requirements of any of this Part for vessels not exceeding 30 metres in length.

## 3. Allocation of Crew and Passengers to Emergency Stations

3.1 The Master of a vessel shall ensure that each crew member on joining the vessel, is allocated an emergency station and is properly informed of emergency station duties.

3.2 Where the number of persons on board, excluding passengers, exceeds four, an Emergency Station List shall be displayed in a conspicuous position and so placed as to be readily observed by all persons on the vessel.

3.3 The Emergency Station List shall be in accordance with Form 1.

3.4 Each cabin allocated for crew or passengers shall be given a number and where there is more than one berth in a cabin, each berth shall be given a letter.

3.5 Crew member identification on the Emergency Station List shall be by name, or designated capacity or in the case of berthed crew, the cabin number for single accommodation and the cabin number with berth letter as a suffix for multi-berth accommodation.

3.6 Where in the allocation of duties the Fiji Marine Board requires the person nominated to take charge of survival craft to possess an appropriate certificate. This fact shall be stated on the Emergency Station List.

## 4. Crew Cabin Emergency Station Notice



4.1 Each berth shall have affixed to the head or side of the berth a notice with the following information:

- (a) Cabin number and berth letters as applicable;
- (b) Emergency Station and emergency duty to be performed;
- (c) Emergency Station Signal; and
- (d) Abandon ship signal.

## 5. Crew Emergency Practice Procedures

5.1 Crew Emergency Practice Procedures shall be conducted in accordance with the procedures specified in Schedule I at intervals of not more than 1 month.

## 6. Emergency Procedures for Passengers

6.1 After completion of embarkation at any port or place and prior to departure from that port or place the Master of a sea going vessel shall ensure that passengers are informed of the location of Emergency Procedures Notices applicable to passengers.

6.2 Passenger Emergency Procedures Notice shall be located in conspicuous places throughout the passenger spaces as required by the Fiji Marine Board.

6.3 Sufficient conspicuous signs shall be displayed indicating the direction to and position of Emergency Stations.

6.4 Passenger Emergency Procedures Notices, in the case of berthed passengers, shall be placed adjacent to the berth of each passenger.

6.5 Passenger Emergency Procedures Notices shall include the following information:

- (a) Cabin number and berth letter where applicable;
- (b) Emergency Signal
- (c) Action to take on hearing emergency signal when in or near own cabin;
- (d) Action to take when not in or near own cabin;
- (e) Location of lifejackets;
- (f) Location of Emergency Station;
- (g) Survival Craft allocation; and
- (h) Abandon Ship Signal

6.6 Notices showing how to don and secure lifejackets shall be displayed in every passenger cabin and in conspicuous places throughout the passenger spaces and these notices shall include information on how to adjust the lifejackets of children.

6.7 When considered necessary by the Fiji Marine Board demonstrations shall be given on the donning and securing of lifejackets.

## 7. Survival Craft Drills

7.1 The Master of the vessel shall ensure that each passenger and crew member is allocated a survival craft where applicable.

7.2 A survival craft list shall be in accordance with Appendix B approved by the Fiji Marine Board, or may form additional columns to Appendix B as approved by the Fiji Marine Board.

7.3 Passengers should remain at their emergency stations during a survival craft drill, but may be dismissed at the discretion of the Master.

7.4 Vessels which are provided with a lifeboat conduct lifeboat drill in accordance with the procedure specified in Schedule II at intervals of not more than 3 months.

7.5 Lifeboat drill shall be arranged so that each lifeboat carried on the vessel is placed in the water with its crew at least once in each period of 6 consecutive months.

7.6 The Master of a vessel which does not carry a lifeboat, but which is provided with a rescue boat, should exercise his crew with that boat as though it were a lifeboat, except that the crew for the boat should not exceed that which is normally used in rescue operations.

7.7 The Master of a vessel which carries a liferaft shall at intervals of not more than 3 months ensure that the liferaft or liferafts carried are ready for launching and that the crew are familiar with the procedure for launching the liferaft or liferafts and their subsequent operation.

## 8. Crew Fire Drills

8.1 The Master of a vessel shall ensure that crew members are allocated special fire duties.

8.1.1 The crew members assigned crew fire duties may have those duties recorded on a crew fire duty list or at the discretion of the Fiji Marine Board included with the Emergency Station List.

8.2 Vessels shall conduct crew fire drill in accordance with the procedure specified in Schedule III at intervals of not more than 3 months.

## 9. Crew Collision Drills

9.1 The Master of a vessel shall ensure that crew members are allocated special collision duties.

9.1.1 The crew members, assigned crew collision duties may have those duties recorded on a crew collision duty list or at the discretion of the Fiji Marine Board included with the Emergency Station List.

9.2 Vessels shall conduct crew collision drill in accordance with the procedure specified in Schedule IV at intervals of not more than 3 months.

## 10. Crew Rocket Drill

10.1 Rocket drill for vessels having a length of 50 metres and over at intervals of not more than 3 months to ensure all crew are familiar with the handling of the line throwing appliance, rockets and flares.

## 11. Emergency Signals

11.1 The general signal to call the crew and passengers to their emergency stations is a signal consisting of a succession of not less than seven short blasts followed by one long blast given on the vessel's whistle or siren. The signal may be supplemented by an identical signal on the vessel's general alarm bell system, and supplemented by visual signals given on the vessel's public address system.

11.2 When the crew are to carry out a drill, the general emergency signal should be used to call the crew to their emergency stations. Then the Master shall, by messenger, public address system or other method at his disposal direct the crew to carry out a specific drill.

11.3 The signal to inform the crew and passengers that the vessel will be abandoned is the order "ABANDON SHIP" given verbally by the Master.

11.4 Where possible the Master shall ensure that all crew members working in the engineroom or other parts of the vessel distant from the survival craft are warned that the vessel is to be abandoned. Such warning shall be given in sufficient time to allow them to reach the survival craft.

11.4.1 Where possible the Master shall ensure that the engineroom controls are placed on "Finished with Engines" before giving the signal to abandon ship. In the case of bridge control engines he should stop the engines.

11.5 Where, for the purpose of practice drills, in the opinion of the Master, the blowing of the whistle, or siren of the vessel would constitute a nuisance outside the vessel, the general emergency signal may be made on the vessel's alarm bell system, vessel's public address system or by hand blown whistles.

## 12. Records

### 12.1 Official Log Book Entries

12.1.1 In a vessel which maintains an official log book an entry shall be made following emergency practice or drill, giving details of such practice or drill.

12.1.2 Where an official log book is not maintained, an entry required by paragraph 12.1.1 shall be made in the vessel's record book.

12.1.3 Where a practice or drill, which is required by this Section to be held is not held, an entry shall be made in the official log book or record book giving reasons for the omission.

12.1.4 When it has not been possible to hold a practice or drill by this Section and which has required an entry in accordance with paragraph 12.1.3 that practice or drill shall be held as soon as practicable after the entry and a further entry shall be made in accordance with paragraph 12.1.1 or 12.1.2.

### 12.2 Crew List

- (i) on board the vessel; and
- (ii) at a place required by the Fiji Marine Board

and shall contain the following particulars;

- (a) the name of the vessel and official number;
- (b) the name of the owner and his address;
- (c) the name of the employer of the crew and his address; and
- (d) in respect of every employee from time to time in the vessel whether or not he is employed under a crew agreement:

12.2.2 If a new crew list is made or any change made in an existing crew list, the employer or his agent shall within two days thereafter deliver to the proper officer a copy of the new list or a list of the changes made.

12.2.3 The Master, or the employer or their agent, shall within two days after a crew list ceases to apply to a vessel deliver such list to the proper officer.

12.2.4 A Master shall on demand produce to the proper officer the list of crew which is required to be kept on board the vessel.

### 12.3 List of All Persons on Board

12.3.1 On all Class 3A, 3B and 3C vessels a list of all persons on board shall be left ashore so that it will be readily available to the proper officer in the case of an emergency. Such list shall contain:

- (a) the name and/or identification number of the vessel; and
- (b) the name and address of each person on board the vessel.

FORM 1

APPENDIX A  
FIJI MARINE BOARD  
EMERGENCY STATION LIST

Name of vessel: \_\_\_\_\_

Crew Member Identification	Emergency Station	Emergency Duty Allocation

Date     /     /

Master

APPENDIX B  
FIJI MARINE BOARD  
SURVIVAL CRAFT LIST

Form 2

Name of Vessel: \_\_\_\_\_

Crew Member Identification	Survival Craft Station		Survival Craft Duty	
	Lifeboat	Liferaft	Lifeboat	Liferaft

## SCHEDULE I

## CREW EMERGENCY PRACTICE PROCEDURES

1. On hearing the general emergency signal, or an equivalent order the crew members, except personnel on duty who, in the opinion of the Master, cannot be relieved from those duties shall proceed to their emergency station and report to the person in charge. Where possible the operation of non-essential electrical, heating and ventilation appliances should be stopped.

2. Every crew member shall wear a lifejacket.

3. The crew member in charge at the emergency station shall ensure that every person is wearing a lifejacket properly adjusted and secured.

4. After reporting to the emergency station, each crew member who has been assigned an emergency duty shall attend to such duty when so directed and then report back to his emergency station. Crew members not assigned specific emergency duties shall remain at their emergency station.

4.1 Crew members assigned to take charge of a survival or a group of survival craft shall ensure that they are ready to be released.

4.1.1 Crew members assigned to assist with the preparation of survival craft shall report to the person in charge of the survival craft and comply with any orders given by that person.

4.2 Crew members assigned to fire fighting duties shall prepare that equipment for use.

4.3 Crew members assigned to close hull openings, internal watertight doors, fire doors, fire dampers and ensure that the mechanical ventilation machinery is stopped, shall carry out that duty.

4.4 Crew members assigned to passenger control shall simulate assisting and directing passengers to their emergency station(s) and maintain order in passages and on stairways.

## SCHEDULE II

## SURVIVAL CRAFT DRILLS

1. At least half the total number of lifeboats carried shall, weather permitting:

- (i) be lowered or placed at the embarkation position;
- (ii) have the painters passed and made fast;
- (iii) have the rudders fitted, plugs fitted or valves closed;
- (iv) have the engine or mechanical propulsion system operated; and
- (v) have the stores and equipment checked.

2. To comply with sub-clause 7.6 of this Section a lifeboat placed in the water shall be:

- (i) manned with its crew; and
- (ii) exercised at the discretion of the Master.

3. Liferrafts and Inflatable Buoyant Apparatus shall be checked to ensure that:

- (i) painters are secured to a strong point on the vessel;
- (ii) liferafts are free and clear for launching;
- (iii) liferaft hydrostatic releases (where fitted) operate;
- (iv) liferaft davits (where fitted) operate.

4. Crew to be instructed in search and rescue and survival procedures including the operation of the survival craft and use of the equipment and stores.

5. Side ladders shall be rigged and checked

6. Rescue boats (these are not survival craft) are swung out, lowered into the water and crew exercised at the discretion of the Master in accordance with sub-clause 7.7 of this Section.

### SCHEDULE III

#### CREW FIRE DRILL

A fire drill shall be conducted as follows:

- (a) A crew member appointed for that purpose by the Master shall direct a simulated attack on a fire which for the purpose of the drill, shall be assumed to have occurred in a selected part of the vessel, this selected part should be varied from drill to drill.
- (b) On receipt of the fire warning the fire pumps shall be prepared.
- (c) The members of the crew forming the fire party shall be sent to the location of the assumed fire.
- (d) The fire party shall be exercised in fire fighting in the vicinity of the assumed fire by:
  - (i) suitable fire extinguishers being brought to the vicinity of the assumed fire; and
  - (ii) on a vessel having a fire hydrant using at least one fire hose supplied with water at working pressure from a fire pump.
- (e) Not less than once in each period of three consecutive months, a practical demonstration of the use of the portable fire extinguishers shall be given by expending the charge of at least one extinguisher of each type aboard which can be refilled aboard.
- (e) The Crew shall be exercised in:
  - (i) the closing of doors, ventilating shafts and other openings so as to isolate the assumed fire from other parts of the vessel, and in particular stairways and liftshafts, and to reduce the supply of air to the assumed fire;
  - (ii) the use of breathing apparatus and safety lamps; and
  - (iii) any other emergency procedures considered necessary to combat the assumed fire.
- (g) The crew shall be instructed in the use of all fire fighting appliances provided in the vessel.

### SCHEDULE IV

#### CREW COLLISION DRILL

Collision drill shall be conducted as follows:

- (a) Bulkhead doors in the various sections of the vessel shall be closed immediately by members of the crew allotted to that duty.
- (b) A messenger from each party that has been allotted to a section of the vessel shall report to the Master, or to the officer appointed for that purpose by the Master, when all bulkhead doors in that section are closed.
- (c) Doors other than those in the shell, which were already closed at the commencement of the drill, shall be opened and then closed.
- (d) Nothing in the last preceding paragraph shall be taken to authorise the opening while the vessel is at sea of any watertight door or other contrivance which is required by the Fiji Marine Board to be kept closed.
- (e) An officer appointed by the Master to be the officer in charge of the drill shall indicate a section of the vessel where the emergency is assumed to have occurred for the purposes of the drill.
- (f) Members of the crew allotted to sounding duty shall immediately sound tanks and bilges in the section of the vessel indicated for the purposes of the drill.
- (g) A messenger from the sounding party shall communicate with, as required:
  - (i) the officer in charge of the drill; and
  - (ii) the Chief Engineer
- (h) As many pumps as are available and operated from the engine room shall be connected to the section of the vessel indicated for the purposes of the drill.
- (i) A report shall be made to the bridge by messenger or other means when the pumps are ready for action.
- (j) Ship's side doors, side scuttles, valves and similar contrivances shall be closed as directed.
- (k) A report shall be made to the bridge by messenger or other means when the side doors, side scuttles, valves and similar contrivances have been closed.
- (l) The stability of the vessel shall be estimated assuming the damaged condition, including an assessment of the necessary corrective action to maintain an adequate positive stability condition.

## PART III—SAFETY OF NAVIGATION

## 13. Application

13.1 This Part shall apply to all vessels.

## 14. Automatic Pilot

14.1 An automatic pilot shall not be used in areas of high traffic density, in conditions of restricted visibility and in other hazardous navigational situations unless it is possible to establish human control of the vessel's steering immediately.

14.2 In the circumstances set out in sub-clause 14.1, it shall be possible for the officer of the watch to have available without delay the services of a qualified helmsman who shall be ready at all times to take over steering control.

14.3 The change over from automatic to manual steering and vice versa shall be made by or under the supervision of a responsible officer.

14.4 In vessels which have an automatic pilot fitted the manual steering shall be tested after prolonged use of the automatic pilot, and before entering areas where navigation demands special caution.

## 15. Operation of Steering Gear

15.1 In areas where navigation demands special caution, vessels so fitted shall have more than one steering gear power unit in operation when such units are capable of simultaneous operation.

## 16. Steering Gear—Testing and Drills

16.1 Within 12 hours before departure, the vessel's steering gear shall be checked by the vessel's crew. The test procedure shall include, where applicable, the operation of the following:

- (i) the main steering gear;
- (ii) the auxiliary steering gear;
- (iii) the remote steering gear control systems;
- (iv) the steering positions located on the navigating bridge;
- (v) the emergency power supply;
- (vi) the rudder angle indicators in relation to the actual position of the rudder;
- (vii) the remote steering gear control system power failure alarm; and
- (viii) the steering gear power unit failure alarms.

16.2 The checks and tests shall include:

- (i) the full movement of the rudder according to the required capabilities of the steering gear;
- (ii) a visual inspection of the steering gear and its connecting linkage; and
- (iii) the operation of the means of communication between the navigating bridge and steering gear compartment.

16.3 Simple operating instructions with a block diagram showing the change-over procedures for remote steering gear control systems and steering gear power units shall be permanently displayed on the navigating bridge and in the steering gear compartment.

16.4 All officers concerned with the operation and/or maintenance of steering gear shall be familiar with the operation of the steering system fitted on the vessel and with the procedures for changing from one system to another.

16.5 In addition to the routine checks and tests required by sub-clause 16.1 and 16.2 emergency steering drills shall take place at least once every three months in order to practise emergency steering procedures. These drills shall include direct control from within what steering gear compartment, the communications procedure with the navigating bridge and, where applicable, the operation of alternative power supplies.

16.6 The Fiji Marine Board may waive the requirement to carry out the checks and tests required by sub-clauses 16.1 and 16.2 for vessels which regularly ply on voyages of short duration. Such vessels shall carry out these checks and test at least once every week.

16.7 The date upon which the checks and tests prescribed in sub-clauses 16.1 and 16.2 are carried out and the date and details of emergency steering drills carried out under sub-clause 16.5 shall be recorded in the log book or vessel record book or in such manner as may be required by the Fiji Marine Board.

## 17. Danger Messages

17.1 The Master of every vessel which meets with dangerous ice, a dangerous derelict, or any other direct danger to navigation, or a tropical storm, or encounters sub-freezing air temperatures associated with gale force winds causing severe ice accretion on superstructures, or winds of force 10 or above on the Beaufort scale for which no storm warning has been received is bound to communicate the information by all the means at his disposal to vessels in the vicinity, and also to the competent authorities at the first point on the coast with which he can communicate. The form in which the information is sent is not obligatory. It may be transmitted either in plain language (preferably English) or by means of the International Code of Signals. It should be broadcast to all vessels in the vicinity and sent to the first point on the coast to which communication can be made, with a request that it be transmitted to any appropriate Authority.

17.2 The Authority will take all steps necessary to ensure that when intelligence of any of the dangers specified in sub-clause 17.1 is received, it will be promptly brought to the knowledge of those concerned.

17.3 All radio messages issued sub-clause 17.1 shall be preceded by the Safety Signal, using the procedure as prescribed by the Radio Regulations as defined in the Radio Equipment Section.

## 18. Information Required in Messages

18.1 The following information is required in danger messages:

(a) Ice, Derelicts and other direct dangers to Navigation:

- (i) the kind of ice, derelict or danger observed;
- (ii) the position of the ice, derelict or danger when last observed; and
- (iii) the time and date when danger last observed.

(b) Tropical Storms:

- (i) a statement that a tropical storm has been encountered. This obligation should be interpreted in a broad spirit, and information transmitted whenever the Master has good reason to believe that a tropical storm is developing or exists in his neighbourhood;
- (ii) time, date position of vessel when the observation was taken; and
- (iii) as much of the following information as is practicable should be included in the message:

- barometric pressure, preferably corrected (stating millibars, millimetres, or inches, and whether corrected or uncorrected);
  - barometric tendency (the change in barometric pressure during the past three hours);
  - true wind direction;
  - wind force (Beaufort scale);
  - state of the sea (smooth, moderate, rough; high);
  - swell (slight, moderate, heavy) and the true direction from which it comes.
- Period or length of swell (short, average, long) would also be value; and true course and speed of vessel.

(c) Subsequent Observations

When a Master has reported a storm, it is desirable, but not obligatory, that further observations be made and transmitted hourly, if practicable, but in any case at intervals of not more than three hours, so long as the vessel remains under the influence of the storm.

(d) Winds of force 10 or above on the Beaufort scale for which no storm warning has been received.

This is intended to deal with storms other than the tropical storms referred to in paragraph (b): when such a storm is encountered, the message should contain similar information to that listed under that paragraph but excluding the details concerning sea and swell;

(e) Sub-freezing air temperatures associated with gale force winds causing severe ice accretion on superstructures:

- (i) Time and date;
- (ii) Air temperature;
- (iii) Sea temperature (if practicable); and
- (v) Wind force and direction.

19. Meteorological Services

19.1 Any vessels in transmitting or receiving transmissions "to all stations" of Meteorological Forecasts and Warnings shall conform to the Provisions of the Radio Regulations, (as defined in section 12).

20. Speed Near Ice

20.1 When ice is reported on or near his course the Master of every vessel at night is bound to proceed at a moderate speed or to alter his course so as to go well clear of the danger zone.

21. Routing

21.1 The practice of following, particularly in converging areas, routes adopted for the purpose of separation of traffic including avoidance of passage through areas designated as areas to be avoided unsafe conditions, is to be followed by all vessels concerned.

22. Distress—Messages—Obligations and Procedures

22.1 The Master of a vessel at sea, on receiving a signal from any source that a vessel 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 that he is doing

so. If he is unable or, in the special circumstances of the case, considers it unreasonable or unnecessary to proceed to their assistance, he must enter in the log book or vessel record book the reason for failing to proceed to the assistance of the persons in distress.

22.2 The Master of a vessel in distress, after consultation so far as may be possible, with the Masters of the vessels which answer his call for assistance, has the right to requisition such one or more of those vessels as he considers best able to render assistance, and it shall be the duty of the Master or Masters of the vessel or vessels requisitioned to comply with the requisition by continuing to proceed with all speed to the assistance of person in distress.

22.3 The Master of a vessel shall be released from the obligation imposed by sub-clause 22.1 when he learns that one or more vessels other than his own have been requisitioned and are complying with the requisition.

22.4 The Master of a vessel shall be released from the obligation imposed by sub-clause 22.1 and if his vessel has been requisitioned, from the obligation imposed by sub-clause 22.2 if he is informed by the persons in distress or by the Master of another vessel which has reached such person that assistance is no longer necessary.

22.5 The provisions of this clause do not prejudice the International Convention for the unification of certain rules with regard to Assistance and Salvage at Sea, signed at Brussels on 23 September 1910 particularly the obligation to render assistance imposed by Article II of that Convention.