
STATUTORY INSTRUMENTS

1975 No. 330

The Fishing Vessels (Safety Provisions) Rules 1975

PART II

FISHING VESSEL CONSTRUCTION RULES

A

HULL (INCLUDING SUPERSTRUCTURES) AND EQUIPMENT

Structural Strength

2.—(1) The structural strength of every fishing vessel of 12 metres in length and over to which these Rules apply and the number and disposition of bulk-heads shall be adequate for the intended service.

(2) Every such vessel shall be provided with a watertight collision bulkhead in the fore part of the vessel and main and auxiliary machinery essential for the propulsion and safety of the vessel shall be situated in a watertight machinery compartment, except that vessels constructed substantially of wood may be provided with a wooden bulkhead or bulkheads of solid and substantial construction separating the fish hold from the rest of the vessel.

B

WATERTIGHT INTEGRITY

Closing arrangements

3. In every vessel of 12 metres in length and over to which these Rules apply the number of openings in the outer watertight structure of the vessel shall be as few as reasonably practicable and shall be provided with effective closing arrangements where required by the provisions of these Rules.

Doors

4. In every vessel of 12 metres in length and over to which these Rules apply doors fitted in the outer watertight structure shall be of substantial construction permanently and strongly attached to the bulkhead and so framed, stiffened and fitted that the whole structure of which they are part is of equivalent strength to the unpierced bulkhead. They shall be capable of being closed weathertight by means of gaskets and clamping arrangements or other equally effective means permanently attached to the bulkhead or to the door and arranged so that they may be operated from each side of the bulkhead.

Hatchway covers

5.—(1) Subject to paragraph (2) of this Rule, in every vessel of 12 metres in length and over to which these Rules apply where hatchway covers are constructed of wooden boards with waterproof covers—

- (a) the unsupported span of the wooden boards shall not exceed 1.5 metres;
- (b) the finished thickness of the wooden boards shall be not less than 4 millimetres for each 100 millimetres of unsupported span and the width of their bearing surfaces shall not be less than 65 millimetres, except that no wooden board shall have a finished thickness of less than 40 millimetres;
- (c) a waterproof cover of suitable material and of adequate strength shall be provided for every hatchway and be capable of being secured in place in accordance with sub-paragraphs (e) and (f) below;
- (d) where portable beams are provided to support hatchway covers the strength of such beams shall be calculated using the assumed static loads given in sub-paragraph (3)(a) below and the mechanical properties of the material used in the construction and such beams shall be of adequate strength for their intended service;
- (e) cleats shall be set to fit the taper of the wedges, spaced 600 millimetres centre to centre and at least 65 millimetres wide. The end cleats on each end or side shall be not more than 150 millimetres from the hatch corners;
- (f) an adequate number of battens and wedges of efficient pattern and in good condition shall be provided. The wedges shall be of tough wood or equivalent material cut to a taper of not more than 1 in 6 and shall not be less than 12 millimetres thick at the toes;
- (g) steel bars shall be provided to ensure that each section of the hatchway covers can be efficiently and independently secured after the waterproof covers have been battened down;
- (h) hatchway covers shall be permanently marked to indicate their correct position.

(2) In any such vessel less than 24.4 metres in length other arrangements equally effective to the requirements of sub-paragraphs (1)(c), (e), (f) and (g) of this Rule may be provided to maintain wooden hatch covers in position and secure them weathertight.

(3) In every vessel of 12 metres in length and over to which these Rules apply where hatchway covers are constructed of material other than wood:—

- (a) for the purpose of strength calculations it shall be assumed that such covers are subjected to the weight of cargo intended to be carried on them or to the following static loads whichever is the greater:—
 - (i) 1.0 tonne per square metre, where the length of the vessel is 24.4 metres or less;
 - (ii) 1.75 tonnes per square metre, where the length of the vessel is 100 metres or more.

For vessels of lengths more than 24.4 metres but not exceeding 100 metres the loads shall be determined by linear interpolation provided that where a hatchway is situated on the superstructure deck in a position abaft a point 0.25 of the Principal Length from the forward perpendicular, the assumed loads may be reduced to not less than 75% of the requirement of this paragraph;

- (b) where such covers are constructed of mild steel, the maximum stress calculated using the assumed static loads set out in sub-paragraph (a) above when multiplied by 4.25 shall not exceed the minimum ultimate strength of the material. Under these loads the deflections shall not be more than 0.0028 times the span;
- (c) every such cover constructed of material other than mild steel shall have strength and stiffness equivalent to those required in the case of a cover of mild steel;
- (d) every such cover shall be fitted with gaskets and clamping devices, or other equally effective arrangements, sufficient to ensure weather-tightness.

Machinery space openings

6.—(1) In every vessel of 12 metres in length and over to which these Rules apply machinery space openings in exposed positions on the freeboard deck shall be properly framed and efficiently enclosed by casings of adequate strength and fitted with doors complying with the requirements of Rule 4 of these Rules.

(2) In every such vessel every such opening, other than a doorway provided in a casing, shall be fitted with covers of strength equivalent to the unpierced structure, and shall be permanently attached thereto and capable of being closed weathertight.

(3) In every such vessel where casings are not fitted the access openings to the machinery space shall be closed in accordance with the provisions of Rule 7(1) of these Rules.

Other deck openings

7.—(1) In every vessel of 12 metres in length and over to which these Rules apply, flush deck scuttles of the screw, bayonet or equivalent type and manholes may be fitted where these are essential for fishing operations and shall be capable of being closed watertight and shall be permanently attached to the structure, provided that such scuttles and manholes may be effectively weathertight only when closed if their design, size and disposition is such that no danger is likely to result from the absence of complete watertightness.

(2) In every such vessel an efficient superstructure, deckhouse or companionway fitted with weathertight doors or other equally effective closing arrangements shall be provided to protect deck openings in the freeboard and superstructure decks other than hatchways, machinery space openings, manholes and flush scuttles.

Ventilators

8. In every vessel of 12 metres in length and over to which these Rules apply coamings of ventilators shall be of substantial construction and capable of being closed weathertight by devices permanently attached to the ventilator or adjacent structure provided that, subject to the requirements of Rule 59(1), weathertight closing appliances need not be fitted to ventilators in which the coamings extend more than 4.5 metres above the freeboard deck or more than 2.3 metres above the superstructure deck and provided further that the requirements of this Rule shall not apply to vessels under 24.4 metres in length where the ventilators are fitted in the top of the casing or deckhouse and where such ventilators are positioned not more than one-fifth of the moulded breadth of the vessel from the centreline of the vessel and the lowest point at which water might gain access through the ventilator is not less than 1.5 metres above the freeboard deck.

Air pipes

9. In every vessel of 12 metres in length and over to which these Rules apply where air pipes to tanks and other spaces below deck extend above the freeboard or superstructure decks the exposed parts of the pipes shall be of substantial construction. Exposed openings of air pipes shall be provided with efficient means of closing weathertight permanently attached to the pipe or adjacent structure. Provision shall be made to prevent excessive pressure on tank boundaries.

Side scuttles and skylights

10.—(1) In every vessel of 12 metres in length and over to which these Rules apply side scuttles to spaces below the freeboard deck and to enclosed superstructures, deckhouses or companionways on the freeboard deck shall be fitted with hinged deadlights capable of being closed watertight.

(2) In every such vessel every side scuttle shall be fitted in a position such that its sill is above a line drawn parallel to the freeboard deck at side having its lowest point 1 metre above the highest load waterline.

(3) In every such vessel side scuttles, glasses and deadlights shall be of substantial construction.

(4) In every such vessel skylights leading to spaces below the freeboard deck shall be of substantial construction and capable of being closed and secured weathertight, and with provision for adequate means of closing in the event of damage to the inserts.

Side openings

11. In every vessel of 12 metres in length and over to which these Rules apply the number of openings in the sides of the vessel below the freeboard deck shall be the minimum compatible with the design and proper working of the vessel and such openings shall be provided with closing arrangements of adequate strength to ensure watertightness and the structural integrity of the surrounding structure.

Inlets, discharges, and scuppers other than deck scuppers

12.—(1) In every vessel of 12 metres in length and over to which these Rules apply each discharge pipe leading through the hull from spaces below the freeboard deck or from within an enclosed superstructure or deckhouse on the freeboard deck shall have an automatic non-return valve and a positive means of closure from an accessible position except that the requirements of this paragraph shall not apply in those cases where the piping of the scupper or discharge pipe is of substantial thickness and where the entry of water into the vessel through the opening is not likely to lead to dangerous flooding.

(2) In manned machinery spaces in every such vessel controls for main and auxiliary machinery, sea inlets and discharges shall be readily accessible and be provided with indicators showing whether the valves are open or closed. In unmanned machinery spaces suitable warning devices shall be installed to indicate leakage of water into the space or leakage from any other system.

(3) In every such vessel valves and other fittings attached to the hull shall be of steel, bronze or other ductile material and pipes between the hull opening and the valve shall be of steel except that in positions elsewhere and in vessels constructed of materials other than steel, other materials may be used provided that they are suitable for their intended service.

Heights of hatchway coamings, doorways sills, ventilators and air pipes

13.—(1) Subject to paragraph (2) of this Rule, in every vessel of 12 metres in length and over to which these Rules apply every hatchway on the freeboard deck shall have a coaming of substantial construction and the height of the coaming above the deck shall be not less than:—

- (a) 300 millimetres for vessels with Vessel Numerals up to and including 200;
- (b) 380 millimetres for vessels with Vessel Numerals above 200 but no more than 315;
- (c) 460 millimetres for vessels with Vessel Numerals above 315 but not more than 1400;
- (d) 600 millimetres for vessels with Vessel Numerals above 1400.

On superstructure decks the height of the coamings shall be not less than 300 millimetres.

(2) In any such vessel the height of hatch coamings specified in paragraph (1) above may be reduced, or the coamings omitted, where compliance with the requirements of paragraph (1) above is not reasonably practicable provided watertight hatch covers are fitted. Such covers shall be kept as small as reasonably practicable, be permanently attached by hinges or equivalent means and capable of being rapidly closed and battened down.

(3) In every such vessel the height of sills above the level of the deck in doorways provided in companionways, superstructures, deckhouses and machinery casings which give access to parts of the deck exposed to the weather and sea from spaces below the freeboard deck shall be not less than those specified for hatchway coamings in paragraph (1) above provided that the height of such sills above deck may be reduced where there is no direct access to spaces leading below the freeboard deck and where the deckhouse, superstructures or companionways on the freeboard deck are subdivided internally.

(4) In every such vessel the lowest point at which water might gain access through the air pipes shall be not less than 760 millimetres above the freeboard deck or not less than 450 millimetres above the superstructure deck, provided that these heights may be reduced where compliance with the requirements of this paragraph of these Rules is not reasonably practicable because of interference with fishing operations and provided adequate closing arrangements are fitted.

(5) On the freeboard deck of every such vessel the height above deck of ventilators, other than machinery space ventilators, shall be not less than 900 millimetres and on superstructure decks not less than 760 millimetres. The height of ventilators of machinery spaces shall be as high as is reasonable and practicable.

(6) In every such vessel the requirements of the preceding paragraphs of this Rule shall apply in relation to the heights of coamings, sills, air pipes and ventilators above an enclosed deck where water may accumulate and present a hazard to the vessel as they apply in relation to the heights of coamings, sills, air pipes and ventilators above the freeboard deck or superstructure deck as the case may be.

Freeing ports

14.—(1) In every vessel of 12 metres in length and over to which these Rules apply where bulwarks on weather parts of the freeboard deck form wells, the minimum freeing port area in square metres (in this Rule referred to as “A”) on each side of the vessel for each well on the freeboard deck shall be determined in accordance with the following formula in relation to the length and height of the bulwark in the well (in this Rule referred to as “l” and “h” respectively) as follows:

$$A=(1.0+3.5\#h)\#l\times h100$$

l = length of the bulwark in metres.

h = mean height of the bulwark in metres.

Where side houses of superstructures fitted within the well contribute positive buoyancy to the vessel. A may be reduced except that, where such side houses or superstructures are discontinuous and provide pockets for the accumulation of water, no reduction shall be made.

(2) In any such vessel if the well is on a deck whose minimum height at side above the deepest operational waterline is equal to or greater than “R” metres, A may be multiplied by the factor “f” where:—

$$f=10.5\#(HR)(2.35R)$$

$$R=0.95\#+(L30)\#0.9(.95)$$

H = minimum height in metres measured from the deepest operational waterline to the lowest part of the deck at side upon which the well is formed.

L = registered length in metres.

In no case shall the factor “f” be less than 0.75.

(3) In any such vessel, A may include—

(a) the area of those freeing ports with attached means of closing provided that the freeing ports shall only be closed during fishing operations; and

(b) in stern trawlers the apertures in and under the stern doors.

(4) In every such vessel freeing ports shall be so arranged throughout the length of the bulwarks as to provide an effective means of freeing the deck of water. Lower edges of freeing ports shall be as near to the deck as is practicable. Freeing ports greater than 230 millimetres in depth shall be fitted with bars spaced not more than 230 millimetres apart or by other equivalent arrangements.

(5) In every such vessel the arrangements provided in the well for the stowage of equipment and the catch shall not impair the effectiveness of the freeing ports.

(6) In every such vessel intended to operate in zones where icing occurs the means of closing freeing ports when fitted shall be capable of being readily removed.

C

FREEBOARD AND STABILITY

Freeboard

15.—(1) Every vessel of 12 metres in length and over to which these Rules apply shall be so designed, constructed and operated as to ensure that in all foreseeable operating conditions the freeboard will be adequate to provide:—

- (a) compliance with the stability criteria set out in Rule 16 of these Rules;
- (b) reasonable safety for men working on deck;
- (c) reasonable safety to the vessel from the entry of water into enclosed spaces having regard to the closing appliances fitted.

(2) On each side of every such vessel, draught water marks complying with the requirements of section 7 of the Merchant Shipping Act 1894 as amended by the Merchant Shipping (Metrication) Regulations 1973⁽¹⁾ shall be provided.

Stability

16. Every vessel of 12 metres in length and over to which these Rules apply shall in all operating conditions and circumstances set out in paragraphs 10 and 11 of Schedule 3 to these Rules and in all foreseeable operating conditions satisfy the following stability criteria after due correction for the free surface effects of liquids in tanks:—

- (a) the area under the curve of righting levers (GZ curve) shall not be less than:—
 - (i) 0.055 metre-radians up to an angle of 30 degrees;
 - (ii) 0.090 metre-radians up to an angle of 40 degrees or such lesser angle of heel at which the lower edges of any openings in the hull, superstructures, deckhouses or companionways, being openings which cannot be closed weathertight, are immersed;
 - (iii) 0.030 metre-radians between the angles of heel of 30 degrees and 40 degrees or such lesser angle as defined in (ii) above;
- (b) the righting lever (GZ) shall be at least 0.20 metres at an angle of heel equal to or greater than 30 degrees;
- (c) the maximum righting lever (GZ) shall occur at an angle of heel not less than 25 degrees;
- (d) in the upright position the transverse metacentric height (GM) shall not be less than 0.35 metres;

⁽¹⁾ (1973 III, p. 6845).

provided that, for vessels engaged on single or twin boom fishing the values of dynamic stability, righting lever and metacentric height given in sub-paragraphs (a), (b) and (d) respectively of this Rule shall be increased by 20%.

D

BOILERS AND MACHINERY

General

17.—(1) In every vessel of 12 metres in length and over to which these Rules apply machinery, boilers and other pressure vessels shall be of a design and construction adequate for the service for which they are intended and be installed and protected so as to minimise any danger to persons on board.

(2) In every such vessel machinery spaces shall be designed to provide safe and free access to all parts of the machinery which may require servicing at sea.

(3) In every such vessel means shall be provided to prevent overpressure in any part of the machinery, boilers and other pressure vessels. Every boiler shall be provided with not less than two safety valves except that only one safety valve may be fitted if, having regard to the output or any other features of the boiler, adequate protection against overpressure is thereby provided.

(4) In every such vessel machinery spaces which will be periodically unattended at sea shall be provided with proper alarm, detection and machinery control systems.

(5) Prior to installation in every such vessel every boiler or other pressure vessel and its mountings shall be subjected to a hydraulic test to a pressure suitability in excess of the working pressure which will ensure it is adequate in strength and design for the intended service, having regard to:—

- (a) the design and the material of construction;
- (b) its intended purpose;
- (c) the working conditions under which it is intended to be used.

(6) In every such vessel every boiler or other pressure vessel and its respective mountings shall be maintained in an efficient condition.

(7) In every such vessel suitable provision shall be made to facilitate the cleaning and inspection of every pressure vessel.

Boiler feed systems

18.—(1) In every vessel of 12 metres in length and over to which these Rules apply every boiler which provides services essential for the safety of the vessel or which could become dangerous by the failure of its feed water supply, shall be provided with not less than two efficient and separate feed water systems so arranged that either of the systems may be opened for inspection or overhaul independently of the other. Means shall be provided which will prevent overpressure in any part of the systems.

(2) In every such vessel where it is possible for oil to enter the feed water system of a boiler, arrangements shall be provided for interception of the oil in the feed water.

(3) In every such vessel check valves, fittings and pipes in feed water systems shall be designed and constructed to withstand, with an adequate factor of safety, the maximum working stresses to which they may be subjected. Valves, fittings or pipes shall, prior to installation, be subjected to hydraulic test suitably in excess of the maximum working pressure of the boiler to which they are connected or of the maximum working pressure to which the feed line may be subjected, whichever shall be the greater.

(4) In every such vessel boiler feed systems shall be maintained in an efficient condition and the feed pipes shall be adequately supported.

(5) In every such vessel provision shall be made to ensure that an adequate reserve of feed water is available.

Steam pipe systems

19.—(1) In every vessel of 12 metres in length and over to which these Rules apply steam pipes and fittings connected thereto through which steam may pass shall be so designed and constructed as to withstand the maximum working stresses to which they may be subjected, with an adequate factor of safety, having regard to—

- (a) the material of which they are constructed, and
- (b) the working conditions under which they will be used.

(2) Every steam pipe or fitting for every such vessel shall, prior to being put into service for the first time, be subjected to a hydraulic test to a pressure suitably in excess of the working pressure having regard to the requirements of paragraph (1) above.

(3) In every such vessel every such steam pipe or fitting shall be maintained in an efficient condition.

(4) In every such vessel steam pipes shall be adequately supported and in such a manner to avoid damage due to variation in temperature, vibration or otherwise.

(5) In every such vessel means shall be provided for draining every steam range to ensure that the interior of each pipe in the range is kept free of water and that water hammer action will not occur under any foreseeable service conditions.

(6) In every such vessel steam fittings, steam pipes, hot exhaust pipes and other hot surfaces shall be adequately insulated.

(7) In every such vessel steam and exhaust pipes shall not be led through hold spaces unless adequately protected.

(8) In every such vessel, where a steam range may receive steam from any source at a higher pressure than it can withstand with an adequate factor of safety, an efficient reducing valve, relief valve and pressure gauge shall be fitted.

(9) In every such vessel flanges in steam pipe systems shall not be situated above or in the vicinity of switchboards or other electrical equipment except that where this is not practicable provision shall be made to prevent leakage damaging the equipment.

(10) In every such vessel, in exhaust steam systems of machinery fitted with positive shut-off valves where the systems are not designed for the maximum inlet pressure, relief valves of sufficient capacity shall be fitted.

Machinery

20.—(1) In every vessel of 12 metres in length and over to which these Rules apply main and auxiliary machinery essential for the propulsion and safety of the vessel shall be provided with effective means of control. The machinery shall be capable of being brought into operation from the dead ship condition.

(2) In every such vessel where risk from over-speeding of machinery exists provisions shall be made to ensure that the safe speed is not exceeded.

(3) In every such vessel where main or auxiliary machinery or any parts of such machinery are subject to internal pressure such parts shall, prior to installation, be subjected to a hydraulic test to a pressure suitably in excess of the working pressure having regard to:—

- (a) the design and the material of which they are constructed;
- (b) the purpose for which they are intended to be used;
- (c) the working conditions under which they are intended to be used;

and such parts shall at any time thereafter be capable of withstanding such a test.

(4) In every such vessel, main and auxiliary machinery essential for the safety and propulsion of the vessel shall be maintained in an efficient condition.

Means for going astern

21. Every vessel of 12 metres in length and over to which these Rules apply shall have adequate power for going astern to maintain proper control of the vessel in all foreseeable service conditions.

Shafts

22. In every vessel of 12 metres in length and over to which these Rules apply every shaft shall be so designed and constructed that it will withstand the maximum working stresses to which it may be subjected, with a factor of safety which is adequate having regard to:—

- (a) the material of which it is constructed;
- (b) the service for which it is intended;
- (c) the type and size of prime mover or motor by which it is driven or of which it forms a part.

Exhaust systems

23. In every vessel of 12 metres in length and over to which these Rules apply the exhaust pipes and silencers of every internal combustion engine shall be adequately cooled or lagged to protect persons on board the vessel.

Air pressure systems

24.—(1) Every vessel of 12 metres in length and over to which these Rules apply in which machinery essential for the propulsion and safety of the vessel is required to be started, operated or controlled solely by compressed air, shall be provided with an efficient air system, including an adequate number of air compressors and air storage receivers and shall be so arranged as to ensure that an adequate supply of compressed air is available under all foreseeable service conditions.

(2) In every such vessel where the main engines are provided with means for air starting, the total air storage receiver capacity shall be adequate to start the main engine or engines not less than twelve times successively if the engine is reversible or not less than six times successively if the engine is non-reversible.

(3) In every such vessel where only one air storage receiver is provided for starting the main engines separate provision shall be made for the storage of compressed air necessary for starting the main electric generating sets where these are provided with means for air starting.

(4) In every such vessel air pressure systems and their component parts, other than pneumatic control systems, which are subjected to air pressure shall be designed and constructed to withstand, with an adequate factor of safety, the maximum working stresses to which they may be subjected. Prior to being put into service for the first time, air pressure pipes and fittings in such a system shall be subjected to a hydraulic test to twice the system's maximum working pressure.

(5) In every such vessel air pressure systems shall be maintained in an efficient working condition.

(6) In every such vessel adequate pressure relief arrangements shall be provided to prevent overpressure in any part of any such air pressure system, and shall also be provided, where water

jackets of casings of air compressors and coolers might be subjected to dangerous overpressure due to leakage into them from air pressure parts.

(7) In every such vessel provision shall be made to drain the system and to reduce to a minimum the entry of oil into any air pressure system.

(8) In every such vessel provision shall be made to protect the system from the effects of internal explosion.

(9) In every such vessel discharge pipes from starting air compressors shall lead directly to the starting air receivers. Starting air pipes from the air receivers to main or auxiliary engines shall be separate from the compressor discharge pipe system.

(10) In every such vessel where an air pressure pipeline may receive air from any source at a higher pressure than it can withstand with an adequate factor of safety, an efficient reducing valve, relief valve and pressure gauge shall be fitted.

(11) In every such vessel soldered joints shall not be used in air pressure pipe lines.

Cooling water systems—vessels of 24.4 metres in length and over

25.—(1) In every vessel of 24.4 metres in length and over to which these Rules apply where machinery essential for the propulsion and safety of the vessel is dependent for its operation on an efficient cooling water system, there shall be provided at least one circulating pump and, except in the case of any emergency generator, provision shall be made so that in the event of the failure of the pump an alternative pump is available for the same duty. These pumps shall provide an adequate supply of cooling water to the cooling system.

(2) In every such vessel the sea water suctions of cooling systems for essential internal combustion machinery shall be provided with strainers which can be cleaned without interruption of the supply of water.

(3) In every such vessel provision shall be made to prevent overpressure in any part of the system and to indicate the proper working of the system.

Cooling water systems—vessels of 12 metres in length and over but less than 24.4 metres in length

26.—(1) In every vessel of 12 metres in length and over but less than 24.4 metres in length to which these Rules apply where cooling water services are essential for the running of the propelling machinery there shall be at least two means capable of supplying water to such services.

(2) In every such vessel the sea water suctions of cooling systems for essential internal combustion machinery shall be provided with strainers which can be cleaned without interruption of the supply of water.

(3) In every such vessel provision shall be made to prevent overpressure in any part of the system and to indicate the proper working of the system.

Oil systems for lubricating, cooling and control—vessels of 24.4 metres in length and over

27.—(1) In every vessel of 24.4 metres in length and over to which these Rules apply where oil for lubrication, cooling or operation of the main propelling machinery, gearbox and its ancillary services is circulated under pressure, at least two pumps shall be provided for the circulation of such oil where:—

- (a) the output or combined output of the main engine or engines exceeds 500 b.h.p.; or
- (b) lubricating oil under pressure is the only means of control of machinery for the propulsion and safety of the vessel.

Each pump shall be adequate for circulating the lubricating oil. Only one pump shall be required for an emergency generator.

(2) In every such vessel strainers which can be cleaned without interrupting the supply of such oil shall be provided.

(3) In every such vessel provision shall be made to prevent overpressure and to indicate proper operation in every part of the system. Where the means of preventing overpressure is a relief valve it shall be in a closed circuit.

(4) In every such vessel flexible pipes in lubricating oil, cooling oil and hydraulic systems shall be fit for their intended service.

(5) In every such vessel oil level indicators in lubricating oil, cooling oil and hydraulic systems shall be accurate and fit for their intended service and shall be of a type which does not require piercing of the lower part of the tank. Tubular gauge glasses shall not be fitted to lubricating oil or hydraulic oil tanks but suitably protected gauges having flat glasses of substantial thickness and self-closing fittings may be used.

(6) In every such vessel oil pressure pipes in lubricating oil, cooling oil and hydraulic systems shall be made of seamless steel, or other suitable material having flanged joints and shall be properly installed and be led at such a height above the inner bottom as will facilitate inspection and repair. Every such pipe, joint and its fittings other than pipes, joints and fittings in hydraulic systems, shall, before being put into service for the first time, be subjected to a test by hydraulic pressure to 2.8 kilogrammes force per square centimetre or to twice the maximum working pressure, whichever is the greater, and shall at any time thereafter be capable of withstanding such a test.

(7) In every such vessel oil pipes in lubricating oil, cooling oil and hydraulic systems, not being oil pressure pipes, shall be made of steel or other suitable material having flanged joints and shall be properly installed and be led at such a height above the inner bottom as will facilitate inspection and repair. Every such pipe, joint and its fittings other than pipes, joints and fittings in hydraulic control systems, shall, before being put into service for the first time, be subjected to a test by hydraulic pressure to 2.8 kilogrammes force per square centimetre or to twice the maximum working pressure, whichever shall be the greater, and shall at any time thereafter be capable of withstanding such a test.

Oil systems for lubricating, cooling and control—vessels of 12 metres in length and over but less than 24.4 metres in length

28.—(1) In every vessel of 12 metres in length and over but less than 24.4 metres in length to which these Rules apply where the output or combined output of the main engine or engines exceeds 500 b.h.p. and oil for lubrication, cooling or operation of the main propelling machinery and its ancillary services is circulated under pressure, provision shall be made for circulating such oil in the event of failure of a pump.

(2) In every such vessel strainers capable of being readily dismantled for cleaning or replacement of the strainer element shall be provided.

(3) In every such vessel adequate means shall be provided for indicating failure of the lubricating oil system.

(4) In every such vessel flexible pipes in lubricating oil, cooling oil and hydraulic systems shall be fit for their intended service.

(5) In every such vessel where tubular gauge glasses are fitted to lubricating oil or hydraulic oil tanks they shall be of substantial construction, adequately protected and fitted with self-closing arrangements on the tank.

(6) In every such vessel pipes used to convey lubricating oil, cooling oil or hydraulic oil shall be made of seamless steel or other suitable material and shall be properly installed. Pipes, joints and fittings other than pipes, joints and fittings in hydraulic control systems, shall, before being put

into service for the first time, be subjected to a test by hydraulic pressure to twice their maximum working pressure and at any time thereafter shall be capable of withstanding such a test.

Oil fuel installations (boilers and machinery)—general

29.—(1) In every vessel of 12 metres in length and over to which these Rules apply oil fuel used in boilers or machinery shall have a flash point of not less than 60°C (Closed Test), except that where the emergency source of electrical power is a generator driven by internal combustion type machinery having an independent fuel supply and with efficient starting arrangements, the oil fuel provided for this machinery shall have a flash point of not less than 43°C.

(2) In every such vessel oil fuel tanks which are not built into the vessel's structure shall be properly constructed and be provided with save-alls or gutters. These tanks shall not be situated directly above boilers, heated surfaces, stairways, ladders, or electrical equipment other than unbroken runs of cable. Prior to installation these tanks shall be subjected to a hydraulic pressure test. Storage tanks or service tanks shall be tested to a head of water 300 millimetres in excess of the greatest head to which the tank may be subject when in service. In the case of a settling tank the required head of water shall not be less than 2.5 metres above the top of the tank.

(3) In every such vessel adequate means shall be provided for sounding oil fuel tanks and means provided to prevent overpressure in such tanks. The sounding arrangements or oil level indicating gear fitted to settling tanks or daily service tanks shall not permit the escape of oil if these tanks are overfilled. Oil level indicators shall not allow oil to escape in the event of their being damaged.

(4) In every such vessel air pipes shall be led from oil fuel tanks to the open air and the outlet shall be situated so that there will be no danger of fire or explosion resulting from the emergence of oil vapour from the pipe. Pipes shall be fitted with detachable wire gauze diaphragms of non-corrodible material.

Where pipes also serve as overflow pipes provision shall be made to prevent the overflow running into or near a boiler room, galley or other space where ignition may occur.

(5) In every such vessel air pipes from oil fuel tanks and levelling pipes attached to tanks shall have a nett cross-sectional area not less than 1.25 times that of the filling pipes.

(6) In every such vessel self-closing type drains shall be provided for the removal of water from oil fuel in storage tanks or settling tanks or in oily water separators.

(7) In every such vessel pipes connected to any oil fuel storage, settling, or daily service tank, not being a double bottom tank, shall be fitted with a valve or cock which shall be secured to the tank to which it is connected and be capable of being closed from a readily accessible position outside the space in which the tank is situated provided that an inlet pipe may be fitted with a nonreturn valve secured to the tank.

(8) In every such vessel valves forming part of the oil fuel system shall be designed and constructed to prevent the cover of the valve chest being slackened back or loosened when the valve is operated.

(9) In every such vessel pumps forming part of the oil fuel system shall be separate from the feed pumps, bilge pumps and ballast pumps and the connection of any such pumps, and shall be provided with an efficient relief valve which shall be in closed circuit.

(10) In every such vessel the means provided for the storage, distribution and utilisation of the fuel shall be such that the effective use of the engines can be maintained under all foreseeable service conditions.

(11) In every such vessel where steam is generated for main propulsion or essential auxiliary machinery by burning oil fuel under pressure, not less than two oil fuel units shall be provided, each comprising a pressure pump, filters and a heater. The pump, filters and heater shall be of efficient design and substantial construction. Provision shall be made to prevent overpressure in any part of

the oil fuel units. The parts of these oil fuel units which are subject to oil pressure and the joints thereof shall, before being put into service for the first time, be subjected to a test by hydraulic pressure to 28 kilogrammes force per square centimetre or twice their maximum working pressure, whichever is the greater, and shall at any time thereafter be capable of withstanding such a test. Relief valves fitted to prevent over-pressure in the oil fuel heater shall be in closed circuit. Where steam is used for heating oil fuel in bunkers, tanks, heaters or separators, exhaust drains shall be provided to discharge the condensate into an observation tank fitted with a manually controlled drain.

(12) In every such vessel where a gravity oil fuel system is installed filters shall be provided and shall be capable of being cleaned without interrupting the supply of fuel oil.

(13) In every such vessel equivalent arrangements to those set out in paragraph (12) above shall be provided in the fuel supply lines to main and auxiliary oil engines.

(14) In every such vessel save-alls or gutters shall be provided under every oil fuel pump, filter and heater and in way of the furnace mouths to prevent escaping oil from coming into contact with boilers or other heated surfaces.

(15) In every such vessel where flexible pipes are fitted in such systems, they shall be fit for their intended service.

(16) In every such vessel fuel supply lines to main propulsion and essential auxiliary machinery shall be provided with filters so constructed that they may not be opened during use.

Oil fuel installations (boilers and machinery)—vessels of 24.4 metres in length and over

30.—(1) In every vessel of 24.4 metres in length and over to which these Rules apply oil fuel shall be effectively isolated from other liquids. The oil fuel pumping arrangements shall permit the oil fuel to be transferred from any oil fuel storage tank or settling tank into another oil fuel storage tank or settling tank. Provision shall be made to prevent the accidental discharge or overflow of oil overboard. If drinking water or boiler feed water is stored in a tank adjacent to an oil fuel tank a coffer-dam shall be provided which will prevent contamination.

(2) In every such vessel oil fuel tank sounding pipes shall not terminate in crew accommodation, but they may be installed in passage-ways.

(3) In every such vessel oil fuel level indicators shall be accurate and fit for their intended service, and shall be of a type which does not require piercing of the lower part of the oil fuel tank. Tubular gauge glasses shall not be fitted to oil fuel tanks but suitably protected gauges having flat glasses of substantial thickness and self closing fittings may be used.

(4) In every such vessel overflows from settling tanks and daily service tanks shall be led back to the storage tanks or to an overflow tank and means shall be provided to indicate when the tanks are overflowing.

(5) In every such vessel where oil fuel tanks are alternatively used as liquid ballast tanks proper means shall be provided to isolate the oil fuel and ballast systems.

(6) In every such vessel oil fuel filling stations shall be isolated from other spaces and be adequately drained and independently ventilated. Provision shall be made to prevent over-pressure in oil-filling pipe lines.

(7) In every such vessel oil fuel pressure pipes shall be made of seamless steel or other suitable material having flanged joints and shall be properly installed and be led at such a height above the inner bottom as will facilitate inspection and repair. Every such pipe, joint and its fittings shall, before being put into service for the first time, be subjected to a test by hydraulic pressure to 28 kilogrammes force per square centimetre or to twice the maximum working pressure, whichever is the greater, and shall at any time thereafter be capable of withstanding such a test. Where such pipes are used for conveying heated oil they shall be situated in a position above the platform in well-lighted parts of the boiler room or engine room.

(8) In every such vessel oil fuel pipes not being oil fuel pressure pipes shall be made of steel or other suitable material having flanged joints and shall be properly installed and be led at such a height above the inner bottom as will facilitate inspection and repair. Every such pipe, joint and its fittings shall, before being put into service for the first time, be subjected to a test by hydraulic pressure to 3.5 kilogrammes force per square centimetre or to twice the maximum working pressure, whichever shall be the greater, and shall at any time thereafter be capable of withstanding such a test.

(9) In every such vessel steam heating pipes which may be in contact with oil shall be made of steel and, together with their joints, shall, before being put into service for the first time, be subjected to a test by hydraulic pressure to twice the maximum working pressure, and shall at any time thereafter be capable of withstanding such a test.

(10) In every such vessel every suction pipe from any oil fuel tank situated above an inner bottom within a boiler room or engine room shall be fitted with a valve or cock secured to each tank to which the pipe is connected. Every such valve or cock fitted to an oil fuel suction pipe shall be so arranged that it may be closed both from the compartment in which it is situated and from a readily accessible position outside such compartment not likely to be cut off in the event of fire in that compartment. If any oil tank filling pipe is not connected to an oil fuel tank at or near the top of the tank, it shall be fitted with a non-return valve or with a valve or cock secured to the tank to which it is connected and so arranged that it may be closed from the compartment in which it is situated and also from a readily accessible position outside such compartment not likely to be cut off in the event of fire in that compartment.

(11) In every such vessel master valves at the furnace fronts which control the supply of oil fuel to sets of burners shall be of quick-closing type and fitted in a readily accessible and conspicuous position. Provision shall be made to prevent oil from being turned on to any burner unless the burner has been correctly coupled up to the oil fuel supply line.

(12) In every such vessel provision shall be made for oil fuel pressure pumps and transfer pumps to be stopped from a position outside the compartment in which the pumps are situated.

Oil fuel installations (boilers and machinery)—vessels of 12 metres in length and over but less than 24.4 metres in length

31.—(1) In every vessel of 12 metres in length and over but less than 24.4 metres in length to which these Rules apply oil fuel filling points shall be so arranged that oil fuel will not readily be spilled, overflow, drain or lodge in any space.

(2) In every such vessel pipes used to convey fuel oil shall be made of seamless steel or other suitable material and shall be properly installed. Pipes, joints and fittings shall, before being put into service for the first time, be subjected to a test by hydraulic pressure to twice their maximum working pressure, and at any time thereafter shall be capable of withstanding such a test.

(3) In every such vessel where tubular gauge glasses are fitted to oil fuel tanks they shall be of substantial construction, adequately protected and fitted with self-closing arrangements on the tank.

Oil fuel installations (cooking ranges and heating appliances)

32.—(1) In every vessel of 12 metres in length and over to which these Rules apply where cooking ranges or heating appliances within crew spaces are supplied with fuel from an oil tank, the tank shall be situated outside the space containing the cooking range or heating appliance and the supply of oil to the burners shall be capable of being controlled from outside that space. Ranges or burners using oil fuel having a flash point of less than 60°C (Closed Test) shall not be fitted. Means shall be provided to shut off the fuel supply automatically at the cooking range or heating appliance in the event of fire or if the combustion air supply fails. Such means shall require manual resetting in order to restore the fuel supply.

(2) In every such vessel the oil tank supplying the cooking range or heating appliance shall be provided with an air pipe leading to the open air, and in such a position that there will be no danger of fire or explosion resulting from the emergence of oil vapour from the open end of the pipe. The open end shall be fitted with a detachable wire gauze diaphragm.

(3) In every such vessel adequate means shall be provided for filling every such tank and for preventing overpressure.

Ventilation

33. In every vessel of 12 metres in length and over to which these Rules apply every space in which an oil fuel tank or any part of an oil fuel installation is situated shall be adequately ventilated.

Liquefied petroleum gas installations (cooking ranges and heating appliances)

34.—(1) In every vessel of 12 metres in length and over to which these Rules apply installations using liquefied petroleum gas shall be properly and safely fitted and fit for their intended service.

(2) In every such vessel an odouriser shall be added to the gas to enable the presence of gas to be detected by smell, even when its concentration in air is below that of the lower limit of flammability.

(3) In every such vessel containers holding liquefied petroleum gas shall be securely stowed on deck or in a well ventilated compartment situated on the deck, except that in any vessel of 24.4 metres in length and over, where deck stowage is not reasonably practicable, such gas containers may be stowed in spaces below deck, provided that such spaces are adequately ventilated and electrical equipment in such spaces is of flame-proof construction. Where drainage is provided from compartments containing such gas containers, drains shall lead directly overboard.

(4) In every such vessel spaces containing cooking ranges or heating appliances which use liquefied petroleum gas shall not be fitted with openings leading directly below to accommodation spaces or their passageways, except that where this is not reasonably practicable and such openings are fitted mechanical exhaust ventilation trunked to within 300 millimetres of the deck adjacent to the appliance, together with adequate supply ventilation, shall be provided.

(5) In every such vessel spaces where appliances consuming liquefied petroleum gas are used shall be adequately ventilated.

(6) In every such vessel mechanical ventilation systems fitted to any space in which such gas containers or appliances are situated shall be of such design and construction as will eliminate the hazards due to sparking. The ventilation systems serving spaces containing such gas storage containers or gas-consuming appliances shall be separate from any other ventilation system.

(7) In every such vessel where such gas consuming appliances are fitted below deck and for galleys in vessels of 60 metres in length and over mechanical exhaust ventilation shall be provided.

(8) In every such vessel of 12 metres in length and over, every space containing such a gas consuming appliance shall be provided with gas detection and audible alarm equipment. The gas detection device shall be securely fixed in the lower part of the space in the vicinity of the gas consuming appliance. The alarm unit and indicating panel shall be situated outside the spaces containing the gas storage and consuming appliances.

(9) In vessels of 12 metres in length and over but less than 24.4 metres in length to which these Rules apply where such gas consuming appliances are used in sleeping quarters or in spaces adjacent thereto, a flameproof audible alarm shall be fitted in the sleeping quarters in addition to the alarm required by paragraph (8) above.

(10) In vessels of 12 metres in length and over to which these Rules apply a device shall be fitted in the supply pipe from the gas container to the consuming appliance which will shut off the gas automatically in the event of loss of pressure in the supply line. The device shall be of a type which requires deliberate manual operation to re-set it to restore the gas supply. An automatic shut-

off device which operates in the event of flame failure shall be fitted on all appliances consuming liquefied petroleum gas.

Storage of flammable liquids, toxic liquids, toxic gases and compressed gases

35.—(1) In every vessel of 12 metres in length and over to which these Rules apply cylinders containing flammable, toxic or other dangerous gases, and expended cylinders shall be properly stowed and secured on open decks, and all valves, pressure regulators and pipes leading from such cylinders shall be protected against damage. Such cylinders may be stowed in compartments which meet the requirements set out in paragraph (2) of this Rule.

(2) In every such vessel highly flammable liquids, toxic liquids, toxic gases, and liquefied gases, other than liquefied petroleum gas shall be stored in compartments having direct access from open decks. Such compartments shall have boundary bulkheads constructed from non-combustible materials. Pressure adjusting devices and relief valves, if any, shall exhaust within the compartment. Where boundary bulkheads of such compartments adjoin other enclosed spaces they shall be gas tight and adequately insulated and provided with ventilation arrangements which are separate from other ventilation systems. Ventilation shall be arranged at high and low levels and the inlets and outlets of ventilators shall be positioned in safe areas and fitted with spark arresters.

(3) In every such vessel electrical wiring and fittings shall not be installed within compartments containing highly flammable liquids or liquefied gases except where necessary for service within the space. Where such electrical fittings are installed they shall be suitable for use in a flammable atmosphere.

(4) In every such vessel where cylinders containing flammable or other dangerous compressed gases are carried below deck, cylinders containing one type of compressed gas shall be stowed separately from cylinders containing another type. Compartments containing cylinders of such compressed gases shall not be used for stowage of other combustible products or for tools or objects not belonging to the gas distribution system.

E

BILGE PUMPING ARRANGEMENTS

Requirements for vessels of 24.4 metres in length and over

36.—(1) Every vessel of 24.4 metres in length and over to which these Rules apply shall be provided with:—

- (a) efficient bilge pumping plant and means for drainage so arranged that water entering any part of the hull, other than a space permanently appropriated for the carriage of fresh water, water ballast, oil fuel or liquid cargo and for which other efficient means of pumping or drainage are provided, can be pumped out through at least one suction pipe when the vessel is upright or is listed not more than 5 degrees either way. Wing suction shall be provided if necessary for this purpose. Arrangements shall be provided for an easy flow of water to the suction pipes.

Provided that where the safety of the vessel is not thereby impaired, the bilge pumping arrangements may be dispensed with in any particular compartment or compartments of any vessel or class of vessels;

- (b) arrangements for the drainage of all insulated compartments;
- (c) not less than two independent powered bilge pumps provided that:—
- (i) one such pump may be driven from the main engine;
 - (ii) a ballast pump or other general service pump of adequate capacity may be used as an independent bilge pump;

- (iii) a properly installed bilge ejector in combination with a power driven pump may be provided as a substitute for one independent power driven bilge pump.
- (2) In every such vessel—
- (a) bilge pumps shall be self-priming. Pumps, other than hand pumps of the lever type and pumps provided for peak compartments only, shall, whether operated by hand or by power, be capable of drawing water from any space required by paragraph (1) above to be drained;
 - (b) power bilge pumps shall be capable of giving a speed of water of not less than 2 metres per second through the main bilge pipe when its diameter is that determined by sub-paragraph 5(a) of this Rule. Each pump shall have a direct suction from the space in which it is situated, provided that not more than two direct suctions shall be required in any one space. The diameter of the direct suction shall be not less than that of the main bilge pipe. The direct suctions in the machinery space shall be so arranged that water may be pumped from each side of the space through direct suctions to independent bilge pumps;
 - (c) one of the sea water pumps circulating each main engine shall be fitted with emergency bilge suction connections, which shall be provided with non-return valves, to the lowest drainage level in the machinery space, or as near thereto as is reasonably practicable. In vessels powered by steam the diameter of these connections shall be at least two-thirds of that of the main sea inlet. In motor vessels these connections shall be of the same diameter as the pump inlet. Where any main circulating pump is not suitable for this purpose a direct emergency bilge suction shall be led from the largest available independent power driven pump to the drainage level of the machinery space. Such emergency suction shall be of the same diameter as the main inlet of the pump used. The capacity of the pump so connected shall exceed that of a required bilge pump by an adequate amount. The open end of such suctions or the strainer, if any, attached thereto shall be accessible for clearing. The spindles of the main sea inlet and the direct suction valves shall extend well above engine room platform level;
 - (d) where hand bilge pumps are fitted they shall be either rotary, semirotary or lever operated and shall be operable from above the freeboard deck, and be so arranged that the bucket and tail valve can be withdrawn at all times.
- (3) In every such vessel distribution boxes, valves and cocks fitted in bilge pumping systems shall be in accessible positions.
- (4) In every such vessel—
- (a) pipes from the pumps for draining hold spaces or any part of the machinery space shall be independent of pipes which may be used for filling or emptying spaces in which water or oil is carried;
 - (b) bilge pipes in boiler or machinery spaces including spaces in which oil settling tanks or oil fuel pumping units are situated shall be of steel or other equivalent material;
 - (c) bilge suction pipes shall not be led through double bottom tanks unless they are of heavy gauge steel construction with a minimum number of joints and shall be tested after fitting to a pressure of 3.5 kilogrammes force per square centimetre;
 - (d) bilge suction pipes shall be fitted with flanged joints and shall be properly secured in position and provided with expansion joints or bends. Pipes situated in fish holds, chain lockers or other positions where they are liable to damage shall be adequately protected.
- (5) In every such vessel—
- (a) the internal diameter of main and branch bilge suction pipes shall be determined to the nearest 5 millimetres by the following formulae:

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where d_m = internal diameter of the main bilge suction pipes in millimetres;

d_b = internal diameter of the branch bilge suction pipes in millimetres;

L = Principal Length of vessel in metres;

B = Principal Breadth of vessel in metres;

D = Principal Depth of vessel in metres;

C = Length of compartment in metres;

- (b) the inside diameter of the bilge main and bilge suction directly connected to the pump shall be not less than 50 millimetres;
- (c) bilge and ballast pumping systems shall be so arranged as to prevent water passing from the sea or from water ballast spaces into holds or into machinery spaces or from one watertight compartment to another. The bilge connection to any pump which draws from the sea or from water ballast spaces shall be fitted with either a non-return valve or a cock which cannot be opened simultaneously either to the bilges and to the sea or to bilges and water ballast spaces. Valves in bilge distribution boxes shall be of a non-return type;
- (d) any bilge pipes piercing a collision bulkhead shall be fitted with a screw-down valve at the bulkhead with remote control from above the deck at which the bulkhead terminates, with an indicator showing the position of the valve. If the valve is fitted on the after side of the bulkhead and is readily accessible under all service conditions the remote control may be dispensed with.

(6) In every such vessel bilge suction in the machinery space shall be led from readily accessible mud boxes placed wherever practicable above the level of the working floor of the space. The boxes shall have straight tailpipes to the bilges and covers secured in such a manner as will permit them to be readily opened and closed. The suction ends in hold spaces and tunnel wells shall be enclosed in strum boxes having perforations approximately 10 millimetres in diameter, and the combined area of such perforations shall be not less than twice that of the suction pipe. Strum boxes shall be so constructed that they can be cleared without breaking any joint of the suction pipe.

(7) In every such vessel—

- (a) subject to the requirements of sub-paragraph (b) below, the tanks forming part of the structure of the vessel and all watertight compartments, not being part of the machinery space, shall be provided with efficient sounding arrangements which shall be protected where necessary against damage. Where such arrangements consist of sounding pipes, a thick steel doubling plate shall be securely fixed below each sounding pipe for the sounding rod to strike upon. All such sounding pipes shall extend in readily accessible positions above the vessel's freeboard deck;
- (b) sounding pipes for bilges, coffer dams and double bottom tanks being bilges, coffer dams and tanks situated in the machinery space, shall extend to readily accessible positions above the vessel's freeboard deck unless the upper ends of the pipes are accessible in ordinary circumstances and are furnished with cocks having parallel plugs with permanently secured handles so loaded that on being released they automatically close the cocks. Sounding pipes for bilges shall not be less than 65 millimetres in diameter.

Requirements for vessels of 12 metres in length and over but less than 24.4 metres in length

37.—(1) Subject to paragraphs (2) and (3) below every vessel of 12 metres in length and over but less than 24.4 metres in length to which these Rules apply shall be provided with:—

- (a) efficient means of draining any compartment, other than a compartment appropriated for the storage of oil or fresh water, when the vessel is upright or is listed not more than five

degrees either way. A centre line suction shall be provided in the engine room and in the fish hold to the lowest drainage level of the compartment.

Provided that:—

- (i) if the vessel is divided into watertight compartments the bilge suctions and means of drainage shall be so arranged that any water entering any main watertight compartment can be pumped out through at least one bilge suction situated in such a compartment;
 - (ii) if the vessel is not divided into watertight compartments the means of drainage shall be so arranged that any water entering the vessel can drain to at least one bilge suction;
- (b) not less than two bilge pumps—
- (i) having a total capacity of not less than 455 litres per minute if the vessel is 20 metres in length and over but less than 24.4 metres in length. At least one such pump shall be a power pump having a capacity of not less than 230 litres per minute. Where two power pumps are provided each pump shall be independently driven;
 - (ii) having a total capacity of not less than 275 litres per minute if the vessel is 15 metres in length and over but less than 20 metres in length. At least one such pump shall be a power pump having a capacity of not less than 140 litres per minute. Where two power pumps are provided each pump shall be independently driven;
 - (iii) one of which shall be a hand pump if the vessel is less than 15 metres in length. Each pump shall have a capacity of not less than 90 litres per minute.
- (2) In any such vessel a properly installed bilge ejector in combination with a power driven pump may be provided as a substitute for one power driven bilge pump.
- (3) In any such vessel a general service pump of sufficient capacity may be used as an independent bilge pump. Where more than one pump is installed one of the bilge pumps may be driven from the main engine.
- (4) In every such vessel—
- (a) bilge pumps shall be self-priming. Pumps other than hand pumps of the lever type shall, whether operated by hand or power, be capable of drawing water from any space required by sub-paragraph (1)(a) above;
 - (b) bilge pumps may be arranged for automatic starting provided that the bilge pumping system is fit for its intended purpose;
 - (c) where hand operated bilge pumps are fitted they shall be either rotary, semi-rotary or lever operated and shall be operable from the freeboard deck and shall be so arranged that the bucket and tail valve can be withdrawn for examination and overhaul at all times.
- (5) In every such vessel distribution boxes, valves and cocks fitted in bilge pumping systems shall be in accessible positions.
- (6) In every such vessel—
- (a) pipes from the pumps for draining hold spaces or any part of the machinery space shall be independent of pipes which may be used for filling or emptying spaces in which water or oil is carried;
 - (b) bilge pipes shall be of steel or other suitable material having flanged or screwed joints, provided that flexible piping, if accessible for inspection and jointed with suitable clamps, may be installed where necessary.
- (7) In every such vessel—

- (a) if the vessel is 15 metres in length and over but less than 24.4 metres in length bilge branch suction pipes shall be not less than 50 millimetres inside diameter;
 - (b) if the vessel is less than 15 metres in length bilge branch suction pipes shall be not less than 38 millimetres inside diameter;
 - (c) where a bilge main is fitted the cross sectional area of the bilge main shall be at least equal to the aggregate cross sectional area of the two largest branch suctions connected to the bilge main;
 - (d) bilge pumping systems shall be arranged in accordance with Rule 36(5)(c) of these Rules. Non-return valves shall be fitted in the discharge lines of hand operated bilge pumps unless the pumps are of suitable design and discharge directly onto the deck.
- (8) In every such vessel bilge suctions shall be fitted with readily accessible strainers. The total area of the perforation in the strainer shall be not less than twice the cross sectional area of the bilge pipe.

F

ELECTRICAL EQUIPMENT AND INSTALLATIONS

General

38. In every vessel of 12 metres in length and over to which these Rules apply electrical equipment and installations including any electrical means of propulsion shall be such that the vessel and all persons on board are protected against electrical hazards.

Distribution systems

39.—(1) In every vessel of 12 metres in length and over to which these Rules apply main and emergency switchboards shall be suitably guarded and so arranged as to provide easy access without danger to any person. Adequate non-conducting mats or gratings shall be provided. Exposed parts which may have a voltage between conductors or to earth exceeding 250 volts direct current or 55 volts alternating current shall not be installed on the face of any switch-board or control panel.

(2) In every such vessel hull return shall not be used for the power, heat and light distribution systems.

(3) In every such vessel where two or more generating sets may be in operation at the same time for providing the auxiliary services essential for the propulsion and safety of the vessel each generator shall be arranged to supply such essential services and means shall be provided to trip automatically sufficient non-essential load when the total current exceeds the connected generator capacity.

(4) In every such vessel cable systems and electrical equipment shall be so installed as to reduce interference with radio reception to a minimum.

Electrical precautions

40.—(1) In every vessel of 12 metres in length and over to which these Rules apply electrical equipment shall be so constructed and installed that there will be no danger to any person handling it in a proper manner.

- (a) Subject to sub-paragraph (b) below, where electrical equipment is to be operated at a voltage in excess of 55 volts the exposed metal parts of such equipment which are not intended to have a voltage above that of earth, but which may have such a voltage under fault conditions, shall be earthed;

- (b) exposed metal parts of portable electrical lamps, tools and similar apparatus, to be operated at a voltage in excess of 55 volts shall be earthed through a conductor in the supply cable unless, by the use of double insulation or a suitable isolating transformer, protection at least as effective as earthing through a conductor is provided.
- (2) In every such vessel every fixed electrical cable shall be of a flame retarding type. All metal sheaths and armour of any electric cable shall be electrically continuous and shall be earthed. Electric cable which is neither metal sheathed nor armoured shall, if installed where its failure might cause a fire or explosion, be effectively protected.
- (3) In every such vessel wiring shall be supported in such a manner as to avoid chafing or other damage.
- (4) In every such vessel joints in all electrical conductors except those in low voltage communications circuits shall be made only in junction or outlet boxes or by a suitable method such that it retains the original mechanical, flame retarding and electrical properties of the cable. Junction or outlet boxes shall be so constructed as to confine the spread of fire.
- (5) In every such vessel lighting fittings shall be so arranged that the rise in temperature will not damage the associated wiring or cause a fire risk in the surrounding materials.
- (6) In every such vessel electrical circuits, other than a circuit which operates the vessel's steering gear, shall be protected against overload and short circuit. There shall be clearly and permanently indicated on or near each overload protective device the current carrying capacity of the circuit which it protects and the rating or setting of the device.
- (7) In every such vessel electrical equipment shall not be installed in spaces where flammable mixtures are liable to accumulate unless it is of a type which will not cause ignition.
- (8) In every such vessel every lighting circuit terminating in a bunker or hold shall be provided with an isolating switch positioned outside that bunker or hold.

Requirements for vessels of 24.4 metres in length and over

- 41.—**(1) In every vessel of 24.4 metres in length and over to which these Rules apply where electric power is the only power for maintaining auxiliary services essential for the propulsion or safety of the vessel there shall be provided two or more generating sets of such power that the aforesaid services can be operated when any one of the sets is out of service.
- (2) In every such vessel where the main source of electric power is situated below the uppermost continuous deck and within the machinery casings there shall be provided outside the machinery casings a self-contained emergency source of electric power so arranged as to ensure its functioning in the event of failure by reason of fire or otherwise of the main electrical installation.
 - (3) In every such vessel where the main source of electric power is situated above the uppermost continuous deck and outside the machinery casings such source of power shall be capable of operating simultaneously for a period of at least 3 hours the services indicated in paragraph (5) below in addition to any other electrical load.
 - (4) In any such vessel where properly installed electric navigation lights supplied from the emergency source of power are provided in addition to the normal navigation lights oil navigation lights need not be carried.
 - (5) Subject to paragraph (9) below, in every such vessel the emergency source of electric power shall be capable of operating simultaneously for a period of at least three hours the following services:—
 - (a) the general alarm if electrically operated;
 - (b) the watertight doors if they are electrically or electro-hydraulically operated and their indicators and the warning signals if electrically operated;

- (c) emergency lights at launching stations and over-side, in all alleyways, stairways and exits, in the machinery spaces and in the place where the emergency source of electric power, if any, is situated; and in control stations for radio, navigation or other services essential to the safety of the vessel;
 - (d) emergency navigation lights fitted in accordance with paragraph (4) above, communication equipment, fire detecting systems and signals which may be required in an emergency, and the daylight signaling lamp.
- (6) In every such vessel the emergency source of electric power shall be either accumulator (storage) batteries capable of supplying the services set out in paragraph (5) above without being recharged or suffering an excessive voltage drop, or a generator driven by internal combustion type machinery with an independent fuel supply and with efficient starting arrangements. The fuel provided for such machinery shall have a flash point of not less than 43°C. (Closed Test).
- (7) In every such vessel the emergency source of electric power shall be so arranged that it will operate efficiently when the vessel is listed 22½ degrees either way and when the trim of the vessel is 10 degrees from a level keel.
- (8) In every such vessel adequate means shall be provided for the regular testing of the emergency source of electric power and its associated circuits.
- (9) In any vessel of 24.4 metres in length and over but less than 45 metres in length to which these Rules apply adequate alternative means of supply for the emergency lighting systems set out in sub-paragraph (5)(c) above may be installed.

Requirements for vessels of 12 metres in length and over but less than 24.4 metres in length

- 42.—(1) In every vessel of 12 metres in length and over but less than 24.4 metres in length to which these Rules apply where electric power is the only means for maintaining auxiliary services essential for the safety of the vessel there shall be provided at least two independent sources of electric power, one of which may be main engine driven. Such auxiliary services shall be capable of being operated when any one of the sources of electric power is out of operation.
- (2) In every such vessel the alternative source of electric power required by this Rule shall be capable of operating simultaneously for a period of at least 3 hours the following services:—
- (a) the vessel's emergency lights in stairways and exits, in the machinery space and wheelhouse and at the liferaft storage position;
 - (b) emergency communications and signals equipment if they are operated from the vessel's main source of electric power;
 - (c) the daylight signalling lamp if it is operated by the vessel's main source of electric power.
- (3) In any such vessel the alternative source of electric power may be accumulator (storage) batteries capable of supplying the services set out in paragraph (2) above without being recharged or suffering an excessive voltage drop.
- (4) In every such vessel the alternative source of electric power shall be so arranged that it will operate efficiently when the vessel is listed 22½ degrees either way and when the trim of the vessel is 10 degrees from a level keel.
- (5) In every such vessel adequate means shall be provided for the regular testing of the alternative source of electric power and its associated circuits.
- (6) In any such vessel adequate alternative means of supply for the emergency lighting systems set out in paragraph (2)(a) above may be installed.

Accumulator (storage) batteries and associated charging equipment

43.—(1) In every vessel of 12 metres in length and over to which these Rules apply where accumulator batteries provide the auxiliary electric power such batteries shall, together with dynamos or alternating current generators, be of sufficient capacity to provide an adequate reserve of electric power under all foreseeable service conditions. The batteries, their means of charging, charging voltage and current protection arrangements shall be effective and fit for their intended service.

(2) In every such vessel not less than two dynamos or two alternating current generators each being capable of supplying sufficient auxiliary power for the safety of the vessel and maintaining the charge rate for the vessel's batteries shall be provided as a means of charging those batteries. Dynamos or alternating current generators may be driven by the main engine, subject to compliance with the provisions of paragraph (6) below.

(3) In every such vessel the output of any dynamo or alternating current generator driven by a variable speed engine shall be based on the lowest operational speed of the engine. Throughout the entire operating engine speed range the dynamo or alternating current generator shall operate within its safe speed range.

(4) In every such vessel accumulator (storage) batteries shall be housed in boxes, trays or compartments which are constructed to provide protection of the batteries from damage and ventilated to reduce the accumulation of explosive gas to a minimum. Where fans are fitted in exhaust ducts from compartments assigned principally to the storage of batteries they shall be of a flameproof type. Electrical arrangements liable to are shall not be installed in any compartment used principally for the storage of accumulator batteries. Lead acid and nickel alkaline batteries shall not be housed in the same space.

(5) In every such vessel where accumulator batteries are used for starting the main engine not less than two batteries shall be available and each battery shall be capable of supplying adequate starting power and shall be of sufficient capacity to start the main engine or engines not less than twelve times successively if the engine is reversible or not less than six times successively if the engine is non-reversible, unless alternative means of starting are provided.

(6) In every vessel of 19 metres in length and over but less than 24.4 metres in length to which these Rules apply one battery charging dynamo or alternating current generator shall be driven by an independent prime mover.

G

MISCELLANEOUS PLANT AND EQUIPMENT

Watertight doors

44.—(1) In every vessel of 12 metres in length and over to which these Rules apply the number of doors fitted in any watertight bulkhead shall be as few as reasonably practicable and every such door shall be efficiently constructed and be watertight when closed.

(2) In every such vessel subject to the provisions of paragraph (3) below doors of the sliding type, whether controlled manually or otherwise, shall be operable by efficient gear both at the door itself and from an accessible position above the weather deck and the remote controls for such operation shall be situated outside the compartment containing the door unless such a position is inconsistent with the efficient arrangement of the necessary gearing.

(3) In every such vessel where there is access from the lower part of a machinery space to a watertight shaft tunnel the access opening shall be provided with a sliding watertight door which shall be capable of being operated from each side of the door itself.

(4) In every such vessel means shall be provided at remote operating positions to indicate when a sliding door is closed.

(5) In every such vessel doors of the hinged type shall be capable of being operated from each side of the door itself.

(6) In every such vessel all doors shall be capable of being efficiently operated when the vessel is listed up to 15 degrees either way.

Steering gear—vessels of 24.4 metres in length and over fitted with rudders

45.—(1) Every vessel of 24.4 metres in length and over to which these Rules apply shall be fitted with efficient main steering gear, which shall be power operated in vessels over 45 metres in length, and efficient auxiliary steering gear. No auxiliary steering gear shall be required where suitable duplicate steering gear power units and their connections are fitted in a satisfactory manner and—

- (a) each power unit complies with the requirements of paragraph (2)(b) below;
- (b) each power unit enables the steering gear to meet the requirements of paragraph (2)(a) below.

(2) In every such vessel—

- (a) the main steering gear, rudder and associated fittings shall be adequate to steer the vessel at maximum ahead service speed and shall be so designed that they are not damaged at maximum astern speed or by manoeuvring during fishing operations;
- (b) the auxiliary steering gear shall be capable of being brought rapidly into action and shall be adequate to enable the vessel to be steered at navigable speed.

(3) In every such vessel, the main 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 manually operated, shall be designed to prevent violent recoil of the steering wheel.

(4) Every such vessel shall be so constructed that the person steering from the main wheelhouse control position has a clear view ahead.

(5) Every such vessel which is fitted with power operated steering gear shall have a rudder position indicator in the wheelhouse.

Steering gear—vessels of 12 metres in length and over but less than 24.4 metres in length fitted with rudders

46.—(1) Every vessel of 12 metres in length and over but less than 24.4 metres in length to which these Rules apply shall be provided with efficient main steering gear and auxiliary means of steering.

(2) In every such vessel—

- (a) the main steering gear including the rudder and associated fittings shall be of adequate strength and capable of steering the vessel at maximum ahead service speed and shall be so designed that they are not damaged at maximum astern speed or by manoeuvring during fishing operations;
- (b) the auxiliary means of steering shall be capable of being brought rapidly into action and shall enable the vessel to be steered at a navigable speed.

(3) In every such vessel the main steering gear shall be capable of turning the rudder from 35° on one side to 30° on the other in 30 seconds when the vessel is at navigable speed and from 20° on one side to 20° on the other in 30 seconds when the vessel is at maximum service speed, with the rudder totally submerged.

(4) Every such vessel shall be so constructed that the person steering has a clear view ahead when at the principal steering station.

(5) Every such vessel which is fitted with power operated steering gear shall have a rudder position indicator in the wheelhouse.

Steering gear—vessels of 12 metres in length and over fitted with steering devices other than rudders

47. In every vessel of 12 metres in length and over to which these Rules apply which is fitted with a steering device other than a rudder the construction and operation of such a device shall be adequate and suitable for its intended purpose.

Electrical and Electro-hydraulic steering gear

48.—(1) In every vessel of 12 metres in length and over to which these Rules apply where electrical or electro-hydraulic steering gear is fitted, indicators shall be provided which will show when the power units of such steering gear are in operation. These indicators shall be situated in the machinery control room or other suitable positions and in the wheelhouse.

(2) In every vessel of 45 metres in length and over to which these Rules apply—

(a) electrical and electro-hydraulic steering gear shall be served by two circuits fed from the main switchboard, one of which may pass through an emergency switchboard if one is provided. Each circuit shall have adequate capacity for supplying all the motors which are normally connected to it and which operate simultaneously. Where transfer arrangements are provided in the steering gear room to permit either circuit to supply any motor or combination of motors, the capacity of each circuit shall be adequate for the most severe load condition. The circuits shall be separated as far apart as is reasonably practicable throughout their length;

(b) short circuit protection only shall be provided for such circuits and motors.

(3) In every vessel of 12 metres in length and over to which these Rules apply where electric power is the only source of power for both main and auxiliary steering gear the provisions of paragraph (2) above shall apply except that where auxiliary steering gear is powered by a motor primarily intended for other services suitable overload protection may be fitted.

Communication between wheelhouse and engine room—vessels of 24.4 metres in length and over

49. Every vessel of 24.4 metres in length and over to which these Rules apply shall be provided with two separate means of communicating orders from the wheelhouse to the engine room control platform. One of the means shall be an engine room telegraph except where the means of propulsion are directly controlled from the wheelhouse.

Controllable pitch propellers

50. Where any vessel of 12 metres in length and over to which these Rules apply is equipped with a controllable pitch propeller the propeller and its control gear shall be adequate having regard to the intended service of the vessel.

Refrigerating plants

51.—(1) In every vessel of 12 metres in length and over to which these Rules apply refrigerating plants shall be of a design and construction adequate for the service for which they are intended and shall be so installed and protected as to reduce to a minimum any danger to persons on board.

(2) In every such vessel ammonia and methylchloride shall not be used as refrigerants.

Anchors and chain cables

52. Every vessel of 12 metres in length and over to which these Rules apply shall be equipped with anchors and chain cables sufficient in number, weight and strength, having regard to the vessel's size and intended service except that wire rope of suitable strength may be substituted for chain cable provided that a suitable length and weight of chain cable is attached between the wire rope and the anchor. Where an anchor weighs more than 68 kilogrammes a windlass or a suitable winch normally used for fishing operations shall be provided for working the anchor and shall be maintained in effective working order. Anchor and chain cables with which the vessel is equipped in accordance with this Rule shall comply with the requirements of the Anchor and Cables Rules, 1970(2) so far as those Rules are applicable to that anchor and chain cable.

Spare gear

53. In every vessel of 12 metres in length and over to which these Rules apply adequate spare gear shall be provided for main and auxiliary machinery and electrical equipment and installations of the vessel having regard to the intended service of the vessel.

Winches, tackles and lifting gear

54. Every vessel of 12 metres in length and over to which these Rules apply shall be provided with winches, tackles and lifting gear properly installed having regard to the intended service of the vessel.

H

STRUCTURAL FIRE PROTECTION AND FIRE DETECTION

Structural fire protection—general

55. Every vessel of 12 metres in length and over to which these Rules apply shall be so constructed and equipped that there is no substantial fire risk to the vessel or to persons on board the vessel.

Structural fire protection—vessels with hulls constructed of steel or other equivalent material

56.—(1) In every vessel of 12 metres in length and over to which these Rules apply, the hull of which is constructed of steel or other equivalent material, the superstructure, structural bulkheads, decks and deckhouses shall also be constructed of steel or other suitable material, having regard to the risk of fire.

(2) In every such vessel the bulkheads and decks separating accommodation spaces, service spaces, control stations and emergency firepump space from machinery spaces shall be constructed and insulated to A. 60 standard, provided that the provisions of this paragraph shall not apply to spaces where the fire risk is minimal.

(3) In every such vessel the bulkheads of corridors serving accommodation spaces, other than bulkheads required to meet the provisions of paragraph (2) above, shall be formed of non-combustible B Class divisions extending from deck to deck.

(4) In every such vessel interior stairways serving accommodation spaces, service spaces or control stations shall be constructed of steel. In vessels of 24.4 metres in length and over such stairways shall be within enclosures formed of steel, other equivalent material, or non-combustible B Class divisions, except that a stairway connecting only two decks may be enclosed at one deck only.

(2) (1970 III, p. 4766).

(5) In every vessel of 12 metres in length and over to which these Rules apply the number of openings in the bulkheads and decks referred to in paragraph (2) above shall be as few as reasonably practicable. Such openings shall be fitted with closing arrangements which provide protection equivalent to the surrounding structure in resisting fire. In vessels less than 24.4 metres in length the doors provided in casings of the main propelling machinery and boiler spaces shall be self-closing when such casings extend at least 1.8 metres above the freeboard deck.

(6) In every vessel of 12 metres in length and over to which these Rules apply the number of openings in the bulkheads and decks referred to in paragraphs (3) and (4) above shall be as few as reasonably practicable and fitted with closing arrangements which provide protection equivalent to the surrounding structure in resisting fire. Doors fitted to stairway enclosures shall be self-closing and arrangements, where provided, for holding open the doors shall be such that the doors close automatically in the event of fire.

(7) In every such vessel lift trunks in accommodation and service spaces shall be constructed of steel or equivalent material and the openings therein shall be provided with adequate means of closing which will contain smoke and draughts within the lift trunks and which provide protection equivalent to the surrounding structure in resisting fire.

(8) In every such vessel boundary bulkheads and decks of spaces containing emergency sources of power and such bulkheads and decks which separate galleys, paint rooms, lamp-rooms or store-rooms containing flammable materials from accommodation spaces, service spaces or control stations shall be constructed to A.60 standard. Bulkheads, other than boundary bulkheads, to paint rooms, lamp-rooms or any other store-rooms containing flammable materials shall be constructed of steel or equivalent material. Entrances to store-rooms containing highly flammable materials or products shall be from the open deck and the materials or products shall be stored in sealed containers, provided that such an entrance may lead into a passageway if the closing arrangements are adequate.

(9) In every vessel of 24.4 metres in length and over to which these Rules apply bulkheads, linings, ceilings and the support grounds in accommodation spaces, service spaces and control stations shall be constructed of non-combustible material, except that such bulkheads, linings and ceilings may have a combustible veneer the thickness of which shall not exceed 1.5 millimetres.

(10) In every vessel of 12 metres in length and over to which these Rules apply concealed surfaces behind bulkheads, ceilings, panellings and linings in accommodation spaces, service spaces and control stations, together with all exposed surfaces therein shall be such that a Class 1 or Class 2 surface spread of flame shall not be exceeded. Paints, varnishes and other finishings used on these exposed surfaces shall also be such that a Class 1 or Class 2 surface spread of flame shall not be exceeded.

(11) In every such vessel deck coverings within accommodation spaces, service spaces and control stations shall be of a type which will not readily ignite.

(12) In every such vessel curtains, other suspended textile materials and floor coverings shall have adequate fire resistant qualities.

(13) In every such vessel spaces enclosed behind ceilings, panellings or linings in accommodation spaces, service spaces and control stations shall be suitably sub-divided by close fitting draught stops situated not more than 7 metres apart.

(14) In every such vessel pipes conveying oil or other combustible liquids or compressed air shall be constructed from steel or other suitable material. Jointing materials used shall be such that they shall not be rendered ineffective by heat.

(15) In every such vessel overboard scuppers, discharges or other outlets situated below the freeboard deck shall be constructed of steel or other suitable material.

(16) In every such vessel the hinged portions of skylights serving spaces containing either main propulsion machinery, oil-fired boilers or auxiliary internal combustion machinery shall be capable of being operated from inside and outside such spaces.

(17) In every such vessel insulation in accommodation spaces, service spaces, control stations and machinery spaces shall be of non-combustible material and such insulation, fitted on the inside of machinery spaces in positions where oil spillage or the emission of oil vapours may arise, shall have exposed surfaces impervious to oils or oil vapours.

(18) In every such vessel insulation where fitted in refrigerated compartments or fish holds shall be non-combustible unless the exposed surfaces thereof are protected by close fitting cladding.

(19) In any such vessel insulation to refrigerated compartments within accommodation spaces need not be non-combustible provided the exposed surfaces are protected by non-combustible cladding.

(20) In every vessel of 24.4 metres in length and over to which these Rules apply an automatic fire detection and alarm system complying with the requirements of Rule 111 of these Rules shall be provided to compartments within accommodation spaces remote from the control stations.

Structural fire protection—vessels with hulls constructed of a glass reinforced plastic

57.—(1) In every vessel of 12 metres in length and over to which these Rules apply, the hull of which is constructed of glass reinforced plastic, the hull, superstructure, structural bulkheads, decks and deckhouses shall be provided with fire-resistant properties.

(2) In every such vessel the following structures shall be so insulated and constructed as to meet a B.30 standard:—

- (a) the internal surfaces of the deckhead, boundary bulkheads, side shell down to light waterline level and the casings of the main machinery space;
- (b) the adjacent deck areas and bulkheads forming the enclosures to stairways serving accommodation spaces, service spaces or control stations, except that:—
 - (i) all stairways shall be constructed of steel;
 - (ii) a stairway leading between two decks may be enclosed at one deck only;
- (c) bulkheads and decks enclosing the control stations and corridors serving accommodation spaces, service spaces and control stations.

(3) In every such vessel lift trunks in accommodation and service spaces shall be provided with adequate means of closing which will contain smoke and draughts within the lift trunk.

(4) In every such vessel structures enclosing the galley and similar spaces adjacent to or within the accommodation spaces, service spaces or control stations shall be adequately insulated.

(5) In every such vessel exposed surfaces within accommodation spaces, service spaces, control stations or machinery spaces other than those required to be insulated in accordance with paragraphs (2) and (4) above shall have a final layer of suitable fire retardant resin or be coated with a suitable fire retardant paint, except that the foregoing provisions of this paragraph shall not apply to surface laminates which are self-extinguishing.

(6) In every such vessel the number of openings in the bulkheads and decks shall be as few as reasonably practicable and fitted with closing arrangements which provide protection equivalent to the surrounding structure in resisting fire. Doors fitted to stairway enclosures shall be self-closing and arrangements, where provided, for holding open the doors shall be such that the doors close automatically in the event of fire. Doorways fitted to casings situated above the machinery spaces and extending above the free board deck shall be fitted with closing appliances of the self-closing type.

(7) In every such vessel insulation provided within refrigerated compartments or insulated fish-holds shall be non-combustible unless the exposed surfaces of such insulation are protected by close fitting cladding which shall be non-combustible where fitted in spaces containing fire hazards.

(8) In every such vessel where ceilings, panellings or linings are fitted in accommodation spaces, service spaces or control stations the requirements of Rule 56(10) and (13) of these Rules shall apply to such ceilings, panellings or linings.

(9) In every such vessel exhaust pipes and ducts which are liable to become heated shall be adequately insulated and properly positioned.

(10) In every such vessel deck coverings shall comply with the requirements of Rule 56(11) of these Rules.

(11) In every vessel of 24.4 metres in length and over to which these Rules apply an automatic fire detection and alarm system complying with the requirements of Rule 111 of these Rules shall be provided to compartments within accommodation spaces and service spaces remote from the control stations.

Structural fire protection—vessels with hulls constructed of wood

58.—(1) In every vessel of 12 metres in length and over to which these Rules apply, the hull of which is constructed of wood:—

- (a) the following structures shall be constructed from steel or other equivalent material in the propelling machinery space:—
 - (i) the casings;
 - (ii) the beams supporting that part of the deck which forms the crown of this space, except the half-beams and carlings which may be of hard wood and of substantial section;
- (b) bulkheads which separate the machinery spaces from a adjacent accommodation spaces or control stations shall be constructed of steel, other equivalent material or non-combustible material capable of meeting a B.15 standard. Access doors shall be close fitting and provide protection equivalent to the bulkhead in resisting fire;
- (c) the deck of a wheelhouse or control station which forms the crown of the machinery space shall be constructed of steel or other equivalent material.

(2) In every such vessel where cooking or heating appliances are fitted in galleys, service spaces or any space adjacent to or within accommodation spaces and adjacent to wood structure, such surrounding structure shall be adequately insulated.

(3) In every such vessel ladders or stairways forming means of escape from below deck shall be constructed of steel and the deck openings shall be fitted with closing appliances which provide protection equivalent to the structure in resisting fire.

(4) In accommodation spaces, service spaces, control stations and machinery spaces in such vessels, paints, varnishes and other finishings used on exposed surfaces shall be such that a Class 1 or Class 2 surface spread of flame shall not be exceeded.

(5) In every such vessel products and materials which produce smoke or toxic products when exposed to fire shall not be stored in machinery spaces, except those products and materials necessary for operating the machinery.

(6) In every such vessel insulation provided within refrigerated compartments or insulated fish-holds shall be non-combustible unless the exposed surfaces of such insulation are protected by close fitting cladding which shall be non-combustible where fitted in spaces containing fire hazards.

(7) In every such vessel the number of openings in the bulkheads and decks shall be a minimum and fitted with closing arrangements which provide protection equivalent to the surrounding

structure in resisting fire. Doors in casings extending at least 1·8 metres above the crown of machinery spaces on the freeboard deck shall be fitted with closing appliances of the self-closing type.

(8) In every such vessel exhaust pipes and ducts which are liable to become heated shall be adequately insulated and properly positioned.

(9) In every such vessel deck coverings shall comply with the requirements of Rule 56(11) of these Rules.

(10) In every vessel of 24·4 metres in length and over to which these Rules apply an automatic fire detection and alarm system complying with the requirements of Rule 111 of these Rules shall be provided to compartments within accommodation spaces and service spaces remote from the control stations.

Ventilation systems

59.—(1) In every vessel of 12 metres in length and over to which these Rules apply adequate means shall be provided for stopping fans and closing main inlet and outlet openings of ventilation systems from a position outside the spaces served by the ventilation systems.

(2) In every such vessel adequate means shall be provided for closing funnel ventilation openings.

(3) Subject to paragraph (5) below, in every such vessel ventilation systems serving main machinery spaces shall not pass through accommodation spaces, service spaces or control stations.

(4) Subject to paragraph (5) below, in every such vessel ventilation systems serving accommodation spaces, service spaces or control stations shall not pass through main machinery spaces.

(5) In every such vessel the requirements of paragraphs (3) and (4) above shall not apply where suitable materials are used in the construction of the ventilation systems and proper means provided to preserve the integrity of the fire divisions.

(6) In every such vessel ventilation openings shall not be fitted in doors and bulkheads which form part of stairway enclosures:

provided that such openings may be provided in cabin doors which form a fire division if they are situated in the lower portion of the door.

(7) In every such vessel, where reasonably practicable, ventilation ducts serving stairway enclosures required to be ventilated shall not serve any other space.

(8) In every such vessel exhaust ventilation systems from galleys shall be provided with a grease trap and those which pass through accommodation spaces, service spaces or control stations shall be constructed of steel insulated to A.30 standard.

(9) In every such vessel ventilation systems serving propulsion, essential auxiliary machinery spaces and cargo refrigerating machinery spaces shall be independent of other systems and shall provide adequate ventilation.

(10) In every such vessel adequate ventilation systems shall be provided to store-rooms containing flammable products, gas cylinders or other dangerous materials. Each system shall be self-contained and the inlet and outlet openings shall be positioned in safe areas and fitted with spark arresters.

(11) In every such vessel suitable material shall be used in the construction of all ventilation systems.

Means of escape

60.—(1) In every vessel of 12 metres in length and over to which these Rules apply stairways, ladders and passageways shall be arranged to provide ready means of escape from crew accommodation spaces and access to positions on deck or decks where the life saving appliances will be available for use.

(2) In every such vessel at least two means of escape, which may include the normal means of access, shall be provided from accommodation, service or working spaces situated on any one deck level within either watertight or fire resistant boundaries, except that:—

- (a) in vessels less than 24.4 metres in length this provision shall apply to the compartments situated beneath the freeboard deck other than fish-holds;
- (b) only one means of escape may be provided where one such means is adequate having regard to the number of crew and the size of the space involved.

(3) In vessels of 12 metres in length and over to which these Rules apply, as far as is reasonably practicable, the means of escape provided to meet the requirements of paragraph (2) above shall be so arranged that the deck may be reached without passing through spaces containing a fire hazard. Closing arrangements provided to all openings forming part of an escape route shall be capable of being operated from each side. Such means of escape from spaces which are situated below a complete deck shall be of an enclosed type.

(4) In every such vessel at least two suitably located means of escape shall be provided from main machinery spaces except where the size of the machinery space renders this impracticable. Where ladders are provided for escape they shall be of steel. In vessels of 60 metres and over in length one of these ladders shall be completely enclosed from the lower part of the machinery space and lead to a safe position outside this space. Where a door constructed of steel or equivalent material which is capable of being operated from both sides provides access to a safe route from the lower part of the machinery space to the embarkation deck no such enclosure need be provided.

(5) In every such vessel of 12 metres in length and over to which these Rules apply lift trunks shall not be a means of escape for the purpose of these Rules.

Space heaters and cooking stoves

61.—(1) In every vessel of 12 metres in length and over to which these Rules apply electric space heaters, where provided, shall be so constructed and fitted as to reduce the fire risk to a minimum and where such heaters are situated on decks or bulkheads the structure of such decks or bulkheads shall be protected by non-combustible material. Heaters with exposed elements and open flame solid fuel heaters shall not be provided.

(2) In every such vessel heating stoves and other similar appliances shall be secured in position and their exhausts, together with the surrounding structure, provided with adequate fire protection. The exhausts of stoves shall be provided with ready means of cleaning. The dampers fitted in exhausts for controlling draught shall provide an adequate flow of air when in the closed position. Where ventilators are used to provide an adequate flow of air to spaces in which such stoves are installed, these ventilators shall not be fitted with means of closing.

(3) In every such vessel open flame gas heating appliances shall not be fitted except where used as cooking stoves. Adequate ventilation shall be provided to spaces containing such cooking stoves. Pipes supplying gas from the container to the cooking stove shall be constructed of suitable material. Arrangements shall be provided in accordance with the requirements of Rule 34(10) of these Rules for automatic cut-off of the supply of gas when there is a loss of pressure or flame failure.

Automatic fire detection systems

62. In every vessel of 12 metres in length and over to which these Rules apply an automatic fire detection and alarm system complying with the requirements of Rule 111 of these Rules shall be installed in the main propulsion machinery spaces of all such vessels the hulls of which are constructed of combustible material and in other vessels of 24·4 metres in length and over.

I

PROTECTION OF THE CREW

Bulwarks, guard rails and guard wires

63.—(1) In every vessel of 12 metres in length and over to which these Rules apply, efficient bulwarks, guard rails or guard wires shall be provided to a height at least 915 millimetres above the level of the deck at the perimeters of exposed parts of the freeboard and superstructure decks and the tops of any deckhouse or companion way used in operating the vessel. The height above deck of any fixed bulwarks shall be at least:—

- (a) 610 millimetres for vessels with Vessel Numerals up to and including 140;
- (b) 760 millimetres for vessels with Vessel Numerals above 140 but not more than 315;
- (c) 915 millimetres for vessels with Vessel Numerals above 315.

(2) In every such vessel these bulwark heights shall be increased to not less than 915 millimetres by adequate portable stanchions and guard wires.

(3) In any such vessel the height of the fixed bulwarks specified in paragraph (1) above may be reduced at any point if:—

- (a) there would be unreasonable interference with the efficient operation of the vessel if such minimum height were adhered to at that point; and
- (b) adequate protection is provided at that point.

(4) In every such vessel guard rails or guard wires fitted in accordance with paragraph (1) above shall consist of courses of rails or wires supported by stanchions effectively secured on the deck. The openings between the lowest course of the rails or wires and the deck shall not exceed 230 millimetres in height and no opening above that course of rails or wires shall exceed 380 millimetres in height. Where the ship has rounded gunwales the stanchions shall be secured at the perimeter of the flat of the deck.

(5) In every such vessel adequate guard rails, lifelines, gangways or passages shall be provided for the protection of persons on board the vessel when passing between their quarters, machinery spaces and working spaces. Storm rails shall be fitted on the outside of all deck houses and casings.

(6) Every such vessel being a stern trawler shall be provided with doors, gates, or other adequate arrangements at the top of the stern ramp for the protection of persons on board the vessel. A chain or other suitable arrangements shall be provided across the ramp when the doors or gates are open.

(7) In every such vessel an adequate number of lifelines and safety belts shall be provided.

Openings in decks

64.—(1) In every vessel of 12 metres in length and over to which these Rules apply skylight openings which do not provide means of escape shall be provided with protective bars.

(2) In every such vessel access hatchway openings shall be not less than 600 millimetres by 600 millimetres.

Stairways and ladders

65. In every vessel to which these Rules apply stairways and ladders shall be provided of size and strength adequate for the safe working of the vessel at sea and in port. Stairways and ladders shall be provided with non-slip treads and handrails.

J

NAUTICAL EQUIPMENT

Compasses—requirements for vessel of 45 metres in length and over

66. Every vessel of 45 metres in length and over to which these Rules apply shall be provided with:—

- (a) an efficient standard magnetic compass which shall be mounted in a binnacle and sited on the vessel's centre line in a suitable position from which the view of the horizon is least obstructed; and
- (b) an efficient magnetic steering compass mounted in a binnacle sited on the vessel's centre line at the normal steering position unless a projected or reflected image, or a projected and reflected image, of the standard magnetic compass is provided for this purpose, when the said magnetic steering compass shall be mounted in a binnacle or in a pedestal at the emergency steering position where such emergency steering position is situated above the freeboard deck. Where there is no emergency steering position or where the emergency steering position is not above the freeboard deck the said magnetic steering compass shall not be required if a projected or reflected image, or a projected and reflected image, of the standard magnetic compass is provided at the normal steering position, and either a gyro-compass with repeaters or a transmitting magnetic compass with repeaters having a satisfactory emergency electricity supply is provided. In addition to the said gyro-compass or transmitting magnetic compass, a spare magnetic compass bowl with its gimbal units shall be carried on board so that it may be interchanged with the standard compass if that compass shall become unserviceable. The repeaters required in the foregoing provisions of this Rule shall be so positioned that one is at the normal steering position.

Compasses—requirements for vessels of 12 metres in length and over but less than 45 metres in length

67. Every vessel of 12 metres in length and over but less than 45 metres in length to which these Rules apply shall be provided with at least one efficient standard magnetic compass mounted in a binnacle and so fitted that a projected or reflected image, or a projected and reflected image, of the said compass is positioned near the normal steering position, except that in a vessel of less than 24.4 metres in length the compass may be of the overhead or other suitable type capable of being properly compensated.

Compasses—general requirements

68.—(1) In every vessel of 12 metres in length and over to which these Rules apply a voice pipe or other acceptable means of communications shall be provided between the standard compass position and the wheelhouse and the emergency steering position if one is provided.

(2) Vessels of 45 metres in length and over to which these Rules apply, operating in latitudes above 65° North or South, shall be provided with a gyro-compass.

Sounding equipment

69. In every vessel of 12 metres in length and over to which these Rules apply a mechanical depth sounding device or echo depth sounding equipment suitable for navigational purposes shall be provided.

Nautical publications

70.—(1) This Rule applies to every vessel of 12 metres in length and over to which these Rules apply which proceeds more than 5 nautical miles from the coast.

(2) The Secretary of State hereby specifies the charts described in paragraph (3) below and the directions and information mentioned in paragraph (4) below, as the charts, directions and information which appear to him necessary or expedient for the safe operation of vessels to which this Rule applies.

(3) The said charts are those—

- (a) which are of such a scale and which contain sufficient detail as clearly to show—
 - (i) all navigational marks which may be used by a vessel when navigating the waters which are comprised in the chart,
 - (ii) all known hazards affecting those waters, and
 - (iii) any information concerning traffic separation schemes, two-way routes, recommended tracks, inshore traffic zones and deep water routes applicable to those waters and areas therein which are to be avoided;
- (b) which are either published by the Hydrographer of the Navy or, if not so published, are of a similar scale to those so published and contain equivalent detail; and
- (c) which, in all cases, are of the latest available edition and—
 - (i) in the case of charts published by the Hydrographer of the Navy, have been corrected from all relevant Notices to Mariners and Radio Navigational Warnings, and
 - (ii) in the case of charts not so published, have been otherwise adequately corrected.

In paragraph (b) above the reference to the Hydrographer of the Navy includes a reference to any authority in any country other than the United Kingdom duly exercising functions similar to those of the Hydrographer.

For the purposes of paragraph (c)(ii) above, a chart shall be treated as adequately corrected if, in relation to a voyage made by the vessel which is carrying the chart in accordance with paragraph (5) (a) below, all relevant corrections to that chart applicable up to a time 9 months before the beginning of that voyage have been made.

(4) The said directions and information are such as is contained in the publications mentioned in column 1 of Schedule 25 to these Rules, being publications which, in all cases, are of the latest available edition and which incorporate the latest relevant supplements and, in the case of any such publication which is published otherwise than by the publisher specified opposite thereto in column 2 of the said Schedule, is of equivalent standard and content.

(5) Every vessel to which this Rule applies which goes to sea or attempts to go to sea shall carry at least—

- (a) one copy of a chart which complies with the requirements specified in paragraph (3) above, being a chart which is appropriate for each part of the intended voyage; and
- (b) one copy of each of the publications mentioned in Schedule 25 to these Rules, with English language text, as is appropriate for that voyage.

Flags and signalling equipment

71. Every vessel of 12 metres in length and over to which these Rules apply shall be provided with:—

- (a) a proper complement of flags and pennants for communication by the international code of signals when proceeding on a distant water voyage;
- (b) an efficient signalling lamp capable of being used both by day and by night and which shall be provided with a battery of sufficient capacity to operate the lamp continuously for not less than two hours.

Pilot ladders

72. Every vessel of 12 metres in length and over to which these Rules apply where the distance in normal operating conditions from the water to the point of access to the vessel exceeds 2.5 metres, shall be provided with a pilot ladder complying with the Merchant Shipping (Pilot Ladders) Rules 1965(3) as amended(4)

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DOCUMENTATION TO BE CARRIED ON VESSELS

Record of particulars to be kept on vessel

73. In every vessel of 12 metres in length and over to which these Rules apply a copy of the record of particulars referred to in Rule 125 of these Rules shall be kept on board at all times in the custody of the skipper.

Information as to stability to be kept on vessel

74.—(1) In every vessel of 12 metres in length and over to which these Rules apply a book containing the information relating to the stability of the vessel set out in Schedule 3 to these Rules shall be kept on board at all times in the custody of the skipper.

(2) The book kept in accordance with paragraph (1) above shall be appropriately amended whenever its accuracy is materially affected by alteration of the vessel.

Information on loading and ballasting to be kept on vessel

75. In every vessel of 12 metres in length and over to which these Rules apply a book containing working instructions specifying in detail the manner in which the vessel is to be loaded and ballasted in all foreseeable operating conditions shall be kept on board at all times in the custody of the skipper.

(3) (1965 I, p. 2536).

(4) S.I. 1972/531 (1972 I, p. 1816).