distribution boxes shall be of a non-return type. An arrangement of lock-up valves or of blank flanges shall be provided to prevent any deep tank in such a ship being inadvertently run up from the sea when it contains cargo or pumped out through a bilge pipe when it contains water ballast, and instructions for the working of such an arrangement shall be conspicuously displayed nearby.

(3) All distribution boxes and manually operated valves in connection with the bilge pumping arrangements shall be in positions which are accessible under ordinary circumstances.

(4) Bilge suctions in the machinery space and tunnel well of every ship to which this Code applies 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 10mm in diameter, and the combined area of such perforations shall be not less than twice that of the end of the suction pipe. Strum boxes shall be so constructed that they can be cleared without breaking any joint of the suction pipe.

13. Bilge Pumps—(1) Every bilge pump shall be self-priming unless efficient means of priming are provided. Every such pump, other than a pump provided for peak compartments only, shall be so arranged as to be capable of drawing water from any space required by clause 12(1) of this Part of the Code to be drained.

(2) Sanitary, ballast and general service pumps may be accepted as independent power bilge pumps if fitted with the necessary connections to the bilge pumping system.

(3) Hand pumps shall be workable from above the ship's bulkhead deck, if any. They shall be of a type which is easily maintained in efficient condition and should preferably be of the bucket or plunger displacement type. Diaphragm type pumps are acceptable provided such pumps do not also serve as fire pumps. Semi-rotary pumps may be used only for draining small individual compartments such as peak tanks.

14. Number of Bilge Pumps—(1) Bilge pumps shall be provided in accordance with the following table:

Class of Ship	*Length of Ship*	*Main Engine Pumps*	*Independent Power Pumps*	*Hand Pumps*
II, III	Under 15m	1*	–	1*
	15m and under 30m	1*	1	–
	30m and under 45m	–	2	–
IV, VI	Under 15m	1*	–	1
	15m and over	1*	1	–
V	Under 15m	–	–	1
	15m and over	1*	–	1
VII, VIIA, VIII	Under 15m	1*	–	–
	15m and under 45m	1*	1	–
IX	Under 15m	–	–	1
	15m and under 30m	1*	–	1*
	30m and under 45m	1	1	–

* Each of these pumps may be replaced by an independent power pump.

(2) In every ship of Class II, III and VI of 30m in length or over, one of the pumps shall be an efficient emergency pump of a submersible type having its source of power and the necessary controls situated above the ship's bulkhead deck.

15. Bilge Pipes—(1) All pipes from the pumps for draining cargo spaces or any part of the machinery space shall be distinct from pipes which may be used for filling or emptying spaces in which water or oil is carried. All bilge suction pipes shall be of steel or other approved material of approved wall thickness. Bilge suction pipes in such a ship shall not be led through oil tanks, unless the pipes are enclosed in an oil-tight trunkway. Such pipes shall not be led through double-bottom tanks. Such pipes shall be made with flanged joints, and shall be thoroughly secured in position and protected where necessary against the risk of damage. Efficient expansion joints or bends shall be provided in each line of pipe.

(2) The internal diameter of main and branch bilge suction pipes shall be determined to the nearest 5mm calculated according to the following formulae:

$$dm = 1.68\sqrt{L(B+D)} + 25mm$$

$$db = 2.15\sqrt{C(B+D)} + 25mm$$

where

dm = internal diameter of the main bilge suction pipe in millimetres.

db = internal diameter of the branch bilge suction pipe in millimetres

L = length of ship in metres

B = breadth of ship in metres

D = moulded depth of ship to bulkhead deck in metres

C = length of compartment in metres.

No main bilge suction pipe in any ship of Class II, III, VII, VIIA or VIII shall be less than 65mm in bore, and no branch suction pipe shall be less than 50mm in bore. No bilge suction pipe in any ship of Class IV, V, VI and IX shall be less than 32mm in bore provided that in such ships of less than 10 metres in length no bilge suction pipe shall be less than 25mm bore.

16. Bilge Alarms—In every ship other than an open or partially decked ship, the space in which the main propulsion machinery is located and which contains through hull fittings shall be fitted with a bilge level device which is connected to an audible alarm located near the steering position. The power supply for the audible alarm shall be available at all times there is any person on board.

17. Sounding Pipes—In every ship of 24 metres in length or over, all tanks forming part of the structure of the ship 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 to positions above the ship's bulkhead deck, which shall at all times be readily accessible. Sounding pipes for bilges, coffer dams, and double-bottom tanks, situated in the machinery space may terminate in an accessible position in the machinery space provided they are fitted with closing cocks approved by the Chief Surveyor. Sounding pipes for the bilges of insulated holds shall be insulated and not less than 65mm in diameter.

PART V

MACHINERY INSTALLATIONS

18. General—(1) The machinery, boilers and other pressure vessels, associated piping systems and fittings shall be of a design and construction adequate for the service for which they are intended and shall be so installed and protected as to reduce to a minimum any danger to persons on board, due regard being paid to moving parts, hot surfaces and other hazards. The design shall have regard to materials used in construction, the purpose for which the equipment is intended, the working conditions to which it will be subjected and the environmental conditions on board.

(2) Special consideration will be given to the reliability of single essential propulsion components and the Chief Surveyor may require a separate source of propulsion power sufficient to give the ship a navigable speed, especially in the case of unconventional arrangements.

(3) All boilers, all parts of machinery, all steam, hydraulic,