

38. Batteries—(1) Batteries shall be of a type suitable for marine use and shall be accessible for servicing in their normal position.

(2) Batteries shall be located as high above the bilges as practicable and shall be well secured against movement.

(3) Battery compartments or boxes shall be well ventilated and switches, fuses, or other electrical equipment liable to cause an arc shall not be fitted inside any battery box.

(4) Batteries shall be of sufficient capacity for their intended service and in particular the main engine starting battery shall be of sufficient capacity for not less than six consecutive starts of the main engine. It is recommended that the engine starting battery be used for that purpose only.

(5) Where batteries are located in the engine room they shall be protected by an overhead lid or canopy to prevent tools or other objects falling across the battery terminals.

(6) The interior of battery boxes shall be protected by acid-resisting paint or bitumastic or lead lining.

(7) Batteries for radiotelephone installations shall be installed in accordance with the requirements of the Shipping (Radio) Regulations 1989.

(8) Batteries shall not be tapped for voltages other than the total voltage of all the cells comprising the battery.

39. Cables and their Installation—(1) The rated voltage of any cable shall not be less than the maximum voltage of the circuit. On 3 phase A.C. systems operating at a voltage not exceeding 400 volts, which have the neutral point permanently and effectively earthed, 250 volt cables are deemed to be suitable.

(2)(a) In machinery spaces and refrigerated spaces, or where they are exposed to the weather, or to the action of sea water, fixed cables shall, unless run in steel or copper conduit or steel pipe, be either:

- (i) lead-alloy sheathed, with or without braid or armour; or
- (ii) mineral insulated, copper sheathed; or
- (iii) Polychloroprene sheathed, with or without braid; or
- (iv) Butyl rubber insulated with or without braid.

(b) In galleys, bathrooms, laundries, and toilets, or where they are exposed to harmful gas or vapour, fixed cables shall, unless run in conduit or steel pipe, be either one of the types described in subclause (2)(a) of this clause or PVC insulated PVC sheathed.

(c) Cables having a sheath or covering of PVC shall not be used in refrigerated spaces or in any situation where it is necessary for them to pass through watertight bulkhead glands or deck tubes.

(3) Flexible cables and flexible cords shall not be used for fixed wiring.

(4) The cross-sectional area of conductors shall be sufficient to ensure that at no point in the installation shall the voltage between conductors comprising a circuit, fall more than 6 percent below the nominal voltage, when the said conductors are carrying the maximum current under their normal conditions of service, due allowance being made, where necessary, to ensure satisfactory starting of motors.

(5) Cables shall not be installed in, or be in direct contact with, oil fuel tanks and unless adequately protected, cables shall not be laid under machines or floor plates.

(6) All cables passing through the deck or through watertight bulkheads shall be provided with deck tubes or watertight glands as appropriate.

(7) All wiring, other than mineral insulated copper sheathed cable, shall be stranded cable, of suitable current carrying capacity.

(8) Metal trays used for supporting cables, unless of corrosion-

resistant material, shall be galvanised or provided with an equally effective protective coating applied before erection.

(9) Metal conduits and pipes shall be earthed and shall be electrically and mechanically continuous across all joints.

(10) Conduits, cables, and pipes shall be securely fixed and saddles and fixings for securing conduits, cables, or pipes shall be of non-ferrous material or have a corrosion-resistant finish. Metal staples shall not be used for fixing wiring or cables.

(11) Any type of cable may be installed in non-metallic conduits in accordance with the previous requirements other than subclause (9) of this clause, and in accordance with the following additional requirements:

(a) The conduits shall be of non-flammable, non-absorbent damp-proof material.

(b) The conduits shall not be installed on open decks, or in refrigerated spaces or other locations where they would be liable to exposure and extremes of temperature.

(c) The conduits shall be mechanically continuous across all joints and shall be securely fixed in position.

(d) In situations where the conduits are liable to mechanical damage they shall be provided with mechanical protection.

(12) Cables or conduits fixed within a refrigerated space shall not be embedded in the walls or lagging, but shall be in full view throughout their length. The cables shall be carried on galvanised, perforated trays, which shall be so installed as to leave a space behind the back of the tray and the face of the chamber. As an alternative, cables may be supported on cleats. Conduits may be saddled directly to the face of the chamber and like the saddles and fixing screws are to be of corrosion-resistant material.

(13) Cables and conduits entering a refrigerated space shall pass directly through the walls or lagging of the chamber. The cables shall be protected by continuous tube flanged at each end, or alternatively the cables, may, if desired, be passed through holes bored in solid door frames. Such holes whether for cables or conduits are to be sealed at both ends with a suitable compound.

(14) Where cables are required to pass a refrigerator hold and no alternative is practicable, the cables may be installed behind the insulation, provided they are enclosed in a steel conduit of ample size. Where such conduits pass through watertight bulkheads, the conduits and cables shall be effectively sealed.

40. Generators, Motors and Control Gear—(1) Electric generators, motors, and control gear shall be located in dry, accessible, and well-ventilated positions and shall preferably be of the totally enclosed type.

(2) Every horizontal rotating machine shall:

(a) where practicable be installed in the fore and aft direction.

(b) Where a machine is to be installed athwartships, it shall be ensured that the design of the bearings and the arrangement of the lubrication are satisfactory to withstand the rolling encountered in heavy weather.

(3) Generators and motors which are integral parts of the main engines shall be mounted above the crankshaft centre line.

(4) Auxiliary generators and motors shall be mounted as high as practicable above the bilges. Belt and chain drives for generators and motors shall be properly guarded.

(5) Every electric motor shall be provided with efficient means of starting and stopping, the latter so placed as to be easily operated by the person controlling the motor. Every electric motor having a rating exceeding 0.5 kW shall be provided with the following control apparatus:

(a) Means to prevent automatic restarting after a stoppage due to a drop in voltage or complete failure of supply, where unexpected starting of the motor might be undesirable.

(b) Efficient means of isolation shall be provided, suitably