

tiller on or near the rudder stock shall meet the requirements for auxiliary steering.

(5) In every ship fitted with a power-operated steering gear the position of the rudder shall be indicated at the principal steering position.

31. Protection Against Noise—(1) In every ship with a manned main machinery space, measures shall be taken to reduce noise levels in that space as far as is reasonable and practicable. On completion of such a ship, noise levels in that machinery space shall be measured in a manner approved by the Chief Surveyor.

(2) Any machinery space in which the noise level exceeds 90 dB(A) and which is required to be manned shall be provided with a designated refuge from noise.

(3) Ear protectors shall be provided for use in manned main machinery spaces.

32. Spare Gear and Tools—(1) Every ship shall be provided with a sufficient quantity of spare gear, having regard to the intended service of the ship, to enable repairs or renewals which are essential for the safety of the ship and of persons on board and which can reasonably be effected while the ship is at sea to be carried out, and such tools as are necessary for fitting that spare gear shall be provided.

PART VI

ELECTRICAL INSTALLATION

33. Application—(1) These requirements apply to the following recognised electrical supply systems:

(a) Extra low voltage: Installations which do not exceed 32 volts A.C. or 50 volts D.C.

(b) Low voltage: A.C. installations which exceed 32 volts, but do not exceed 250 volts. D.C. installations which exceed 50 volts, but do not exceed 250 volts.

(2) Requirements for any of the above systems may also be taken from the "Regulations for the Electrical and Electronic Equipment of Ships" issued by the Institute of Electrical Engineers or the equivalent provisions of an approved classification society.

34. General—(1) Materials, appliances, fittings, equipment, cables and other accessories, shall comply with such standards which are approved by the Chief Surveyor.

(2) The electrical system shall be permanently installed, and in such a manner as to provide maximum protection against shock for persons on the ship.

(3) All conductors, switchgear, and accessories shall be of such size as to be capable of carrying, without their respective ratings being exceeded, the maximum current which can normally flow through them.

(4) Electrical equipment, switchboards, and cables shall be so selected and located that they are unaffected by sea, air, water, steam, oil or fumes to which they are likely to be exposed. They shall be so installed that they will be clear of boilers, steam or oil pipes, settling tanks and diesel engine exhaust pipes or manifolds.

(5) The installation of electrical wiring and equipment should be carried out by competent persons experienced in marine electrical work.

(6) Electrical apparatus, batteries, and other sources of power shall not be placed in positions where they will affect the magnetic compass.

(7) Cables shall be kept as high as possible above the bilges and joints in cables shall only be made in suitable junction boxes.

(8) Lighting switches shall be placed in accessible positions near to the entrance of each compartment.

(9) Separate circuits shall be provided for essential services, such as wheelhouse lights, deck lights, searchlights, horn, and radiotelephone. Two separate circuits are required for engine-room lights and each navigation light is to be on a separate circuit.

(10) Screws or nuts securing current-carrying parts shall be effectively locked so that they cannot work loose by vibration. Machines and apparatus shall be unaffected by vibration and shock likely to arise under normal service.

35. Electrical Systems—(1) The following A.C. systems are approved and the minimum main and sub-board switchgear to control each installation is set out as follows:

| <i>System of Supply</i> | <i>Circuit Breaker or Switch Required</i> | <i>Overload Trip Coils or Fuse Links Required</i> |
|---|---|---|
| (a) 3-phase, 3-wire insulated | Three-pole | In each conductor |
| (b) 3-phase, 3-wire insulated, with neutral earthed | Three-pole | In each phase conductor |
| (c) 3-phase, 4-wire with neutral earthed | Three-pole | In each phase conductor |
| (d) Single phase, 2-wire insulated | Two-pole | In each conductor |
| (e) Single phase, with neutral earthed | One-pole | In non-earthed conductor |

(2) The normal frequency employed on A.C. systems shall be 50 Hz and the preferred system for a three-phase installation is subclause (1)(a) of this clause and for a single-phase installation is subclause (1)(d) of this clause.

(3) The two-wire insulated system is the only D.C. system approved for low—and medium-voltage installations and either a two-pole circuit breaker with overload release in each pole, or a fuse in each pole and a two-pole linked switch are required to control such an installation.

(4) For extra-low voltage installations the system can be either, two-wire insulated with control as in (3) above, or can be insulated in one pole only, with the other pole earthed. A single-pole circuit breaker fitted with an overload release, or a fuse and single-pole switch are required to control such an installation.

(5) In all systems, whether earthed or insulated the following is to apply:

(a) The phase and neutral, or positive and negative supplying all appliances and outlets, shall be insulated from earth.

(b) The neutrals or negatives of an earthed A.C. or D.C. system respectively shall be brought back to a common bar on the main switchboard.

(c) From this common bar a suitably sized conductor shall be run to the common earthing point on the ship's hull.

(6) Voltages between conductors shall not exceed the maximum given below: