

AMSB18 ELECTRICAL SYSTEMS ON SHIPS & SHIPYARDS

UNIT-1 COMPONENTS OF ELECTRICAL SYSTEM ON BOARD SHIPS

- 1.1 Merits and demerits of AC and DC on board. Standard voltages - difference between marine and industrial circumstances.
- 1.2 Safety and quality of supply. Electrical power generation on board ships- comparison of diesel, thermal and Nuclear power plants as prime movers- shaft driven generators
- 1.3 Brushless generators, specification of generators.
- 1.4 Specification of motors-speed based and torque based motors.

UNIT-2 CAPACITY CALCULATION OF MAIN POWER PLANT

- 2.1 Diversity factor - single line layout of the DA set. Switch gear for electrical system
- 2.2 Fuses-Switches-relays- contactors- circuit breakers protection for generators of main power plant - preferential tripping
- 2.3 Installation rules for main power plant-emergency plant-layout of IC engine- driven & battery driven E.P.P Location of emergency power source- Different emergency loads.

UNIT-3 DISTRIBUTION SYSTEMS

- 3.1 Ring and radial system. AC single phase & 3-phase system- DC systems- Components of distribution system. MSB, SSB and DB -single line layout.
- 3.2 Rules governing the distribution system.
- 3.3 Regulations governing the installation of MSB.
- 3.4 Special rules for tankers and fighting crafts- Special regulation for installation of electrical system in steering system -earthed and insulated AC systems.
- 3.5 DOL starter Transformers for power and lighting. Specification of transformers.
- 3.6 Cables- specification of cables- testing of cables –Megger - design and selection of cables.
- 3.7 Installation rules. Cable drop in dc two wire distributors fed at one end- fed at both ends.

UNIT-4 ELECTRIC PROPULSION

- 4.1 Advantages- applications- power flow schematic- single line layout- Control of propulsion motors.

UNIT-5 LIGHT FITTINGS

- 5.1 Different sources of light - lighting arrangements in engine room, accommodation place, weather deck etc. Navigation lights.
- 5.2 Communication equipments - Internal and external communication equipments
- 5.3 Electrical system in shipyards - power factor improvement- power tariff - essential regulations -main loads.

Reference Books:

1. G.O.Watson, Marine Electrical Practice, Butterworth Heineman, 1990.
2. Harrington L.Roy, Marine Engineering, SNAME Publications, 1992.
3. E. A. Fernandez, Marine Electrical Technology, 2014.