AMMV20 MARINE BOILERS AND STEAM ENGINEERING

UNIT-1 MARINE BOILERS & BOILER MOUNTINGS

1.1 Scotch Boiler, Cochran, Spanner, Clarkson thimble tube,
1.2 Waste heat recovery calculation,
1.3 Lamont exhaust gas boiler, Composite boilers, Water tube boilers
1.4 Babcock Wilcox, Foster Wheeler- D-type, Double evaporation boilers.
1.5 Safety Valves- Improved High Lift, Full lift and full Bore type: Gauge glass- Ordinary plate type and remote Indicator;
1.6 Automatic feed regulator, three element High & Low water level alarms, Main Steam stop valve, Retractable type Soot blower etc.

UNIT-2 OPERATION & MAINTENANCE OF BOILERS

2.1 Pre-commissioning procedures, Hydraulic tests, steam raising and Operating procedures, Action in the event of shortage of water.
2.2 Regular boiler water tests on board.
2.3 Blowing down of boiler, Laying up a boiler; general maintenance,
2.4 External and internal tube cleaning.
2.5 Tube renewals, etc., maintenance, inspection and survey of boilers.
2.6 Refractory: Purposes of refractory, types of refractory and reasons for failure.
2.7 Oil burning: Procedure of Liquid fuel burning in open furnace, various types of atomizer, Furnace arrangement for oil burning,
2.8 Boiler Control System i.e. master control, fuel control, air control and viscosity control, Introduction to Automation.

UNIT-3 MARINE STEAM PLANTS

3.1 Steam engines - History of multiple expansion marine reciprocating engines &steam turbines.
3.2 Description of different types of steam turbines.
3.3 Layout of plant - General layout of plant & description of a modern geared steam turbine installation including auxiliaries in modern use, open and closed feed system.
3.4 Condensers- Types of condensers, constructional details,
3.5 Location & working principles, contraction and expansion allowances, leak test.
3.6 Effect of change of temperature, circulating water quantity,
3.7 Change of main engine power, condenser surface.

UNIT-4 LUBRICATION

4.1 Suitable oils and their properties,
4.2 Lubrication of main bearings, thrust bearings and gears.
4.3 Gravity and pressure lubrication-oil system and emergency lubrication arrangement.

UNIT-5 OPERATION AND MAINTENANCE OF TURBINES

5.1 Turbine drain system, turbine gland system, warming through a turbine plant, control of speed and power of propulsion, throttle valve control and nozzle control,

5.2 Emergency controls, emergency operation of turbines, vibration in marine steam turbine, steam turbine losses.

5.3 Breakdown and faultfinding.

5.4 Selection of materials: Materials used in various components like blades, rotors, casings, sealing glands, gears etc & their justification.

References Books:

1. GTH. Flanagan, "Marine Boilers" 3rd Edition, Butter worth, London, 2001.
2. K.M.B. Donald, "Marine Steam Turbines", 1st Edition, Institute of Marine Engineers, London, 1977.
3. L.Jackson & T.D. Morton, "General Engineering Knowledge for Marine Engineers", 4th Edition, Thomas Reeds Publication, United Kingdom, 1986.