

Appendix 4A - Syllabus for AMSA Oral Examination, Certificates of Competency, Electro-Technology Officer

Boilers

- Water gauge
- local
- remote
- Operations
- Furnace purging
- Uptake fires
- Superheater fires
- Construction arrangement
- Automatic controls
- Combustion
- Feed Systems Arrangements
- Feed Systems Auto Controls
- Associated Systems & Equipment

Diesel Propulsion

- Operation
- Crankcase explosion
- Scavenge fires
- Oil mist detector
- Starting system
- Air line explosion
- Manoeuvring
- Emergency
- Fuel oil properties
- Combustion
- Associated Systems & Equipment
- Slow, Medium and High speed
- Engine Control and Control Elements
 - Engine Control
 - Control diagram
 - Control and auxiliary systems
- Engine Monitoring
 - Crank angle sensor;
 - Pressure switches and pressure transmitters
 - Thermometers
- Protection devices
- Timing

- Indicator diagram
- Lubrication
- Automation
- Vibration dampers
- Turbo chargers
- Diesel electric propulsion
- Diesel alternators
- Survey

Steam Propulsion

- Operation
- Warming through
- Shutting down
- Manoeuvring
- Emergency
- Parameters
- Turbines
- Protection devices
- Automation
- Protection devices
- Turbo electric
- Turbo alternators
- Operation and construction
- Associated Systems & Equipment

Steering Gears & Rudders

- Emergency Operation
- Construction
- Control
- Survey

Air Compressors

- Safety devices
- Starting air
- Service and control air
- Receivers
- Automation
- Survey

Fire

- Prevention
- Extinction
- Hoses, extinguishers
- BA sets
- Procedures
- Fixed installations
- Detection
- Sensors, systems
- UMS requirements
- Structural fire protection

Pumping Systems

- Fire main
- Oily water separator
- Bunkering
- Bilge and ballast systems
- Salt water system
- Fresh water cooling
- Sewage plant
- Fuel oil system
- Diesel oil system
- Inert gas system
- Lubricating oil system
- Cargo system
- Sanitary system
- Purifiers, clarifiers
- Heaters – Viscosity

Refrigeration Systems

- Safety
- Direct and indirect expansion
- Air conditioning
- Compressors

Materials

- Properties
- Destructive & non-destructive testing

Propellers & Thrusters

- Fixed pitch
- Controllable pitch
- Operating system
- Stern tube bearing
- Screw shafts
- Cross thrusters
- Fixed and CP prop
- Voith Schneider, etc
- DP systems

Dry Docking

- Supply of firefighting water
- Supply of electrical power
- Certificates of Survey
 - Annual
 - Classification
 - Load Line
 - Safety Construction
 - Safety Equipment

Tanks

- Safety precautions
- Entering

Electricity

- Electrical and electronic components
 - Resistors
 - Capacitance
 - Circuit Breakers
 - Transistors and ICs
 - LEDs
 - Thyristor and diodes
- Circuit diagrams
- Emergency generators
- Operation
- Testing
- Fault detection
- AC generators
- Operation
- Construction
- Control equipment
- Fault detection
- Protection devices
- DC generators
- as per AC
- Distribution
- Isolation
- Electric shock
- Protection devices
- Fault detection
- Main switchboard
- Emergency switchboard
- Distribution boards
- Flame proof
- Drip proof
- Intrinsically safe
- Transformers
- Two wire

- Non-earthed and earthed neutral
- Motors
- DC: series, shunt, compound
- AC: single and three phase
- Batteries

Deck Machinery

- Davits
- Winches
- Windlass
- Cranes
- Derricks
- Hatches
- Other

Automation & Control

- Bridge control
- UMS
- Fault detection
- Transfer from manual to auto
- Measuring devices
- Testing
- Calibration

Machinery Records

- Log books
- Trend recording
- Official records

Maritime Law

- MARPOL
- International Convention for the Safety of Life at Sea (SOLAS)
- Marine Orders
- International Shipping Management (ISM) Code
- Other

Management

- Training of Engine-room staff
- Management and organisation of Emergency Response staff/dept

High Voltage

- Equipment
- Hazards
- Operations
- Precautions
- Safety

Computers

- Commercial computer use
- Data processing
- Network

Communications

- GMDSS Equipment
 - SAT C
 - MF/HF Radio
 - VHF
 - EPIRB
- Operation of internal systems

Nav Equipment

- RADAR
- GYRO
- AIS/LRIT/VDR
- Maintenance
- Repair