Compiled by	Approved by
Chief Examiner	Executive Head: Centre of Seafarers

OPERATIONS – SEAFARER CERTIFICATION

GUIDANCE NOTE

Level 3 Assessment – Chief and Second Engineer <3000kW

Content

STCW'78 CHIEF AND SECOND ENGINEER <3000KW OFFICERS ORAL EXAMINATION SYLLABUS GUIDELINE

Second Engineer Officer - Ships less than 3 000 kW STCW Reg. III/3.

The oral examination will concentrate on marine systems and equipment associated with ships up to this limited registered power. It will be concerned with the constructional details, working principles and safe and efficient operation of plant, the correct use of equipment provided for the safety of the ship and the protection of the environment, and the legal and management responsibilities of a certificated engineer officer.
In addition, candidates are required to demonstrate sufficient knowledge to enable them to assume the responsibilities of the Chief Engineer should this officer become incapacitated during a voyage and thus enable vessel to safely make the next port.

Chief Engineer Officer - Ships less than 3 000 kW

STCW Reg. III/3, (*Chief Engineer Officer (Port Operations) and Chief Engineer Officer less than 750 kW Port Operations.)*

The oral examination will be based on the operation, maintenance and management of the marine machinery appropriate to ships of this limited registered power, particularly the recognition of irregularity in the performance of that machinery and the analysis and interpretation of information gained from monitoring equipment. It will also cover emergency procedures directly related to the safety of ships and the protection of the environment, advanced operational engineering knowledge and the legal and administrative duties of a Chief Engineering Officer.

COMMON SYLLABUS FOR CHIEF AND SECOND ENGINEER OFFICERS

The following is a syllabus guideline in which a Chief Engineer and a Second Engineer are required to demonstrate the specific competence detailed in the appropriate paragraph below. The examiner will expect the candidate to be able to answer selected questions from the syllabus guideline.

TOPIC 1 MARINE ENGINEERING

1. Operate, Test and Maintain Marine Engineering Systems

a. marine diesel propulsion machinery, including:
trunk and cross-head diesel engines,
starting and reversing systems,
gearing systems and clutches,
cooling and lubrication systems,
fuel oil preparation systems;

b. steam turbine propulsion machinery, including:
steam boilers and mountings,
steam distribution systems,
steam turbines,
gearing and lubrication systems,
feed water systems;

c. assessment of power output and efficiency of propulsion plant and actions to maintain safe and efficient operation;
d. automatic control and alarm systems for propulsion and auxiliary machinery;
e. sensing, monitoring and measuring devices associated with marine equipment;
f. propulsive transmission systems, including thrust and shaft bearings, stern tubes and propellers;
g. methods of manoeuvring, including bridge control systems and controllable pitch propellers;
h. auxiliary diesel engines and associated equipment;
i. auxiliary steam boilers and associated equipment;
j. air compressors, receivers and associated equipment;
k. methods of testing fuel oil, lubricating oil and cooling water and action necessary to maintain safe conditions;
l. methods of boiler water testing and conditioning and action to be taken to maintain safe conditions;
m. bilge, ballast and fuel oil pumping systems;
n. pollution prevention equipment and systems;
o. steering and stabilising systems, including bow thrusters;
p. refrigeration and air-conditioning systems;
q. cargo handling equipment and deck machinery;
r. fresh water production and conditioning systems.

TOPIC 2 ELECTRICAL, ELECTRONIC AND CONTROL ENGINEERING

1. Operate, Test and Maintain Marine Electrical, Electronic and Control Engineering Systems

a. alternators, generators, motors, switchgear and batteries;
b. AC and DC distribution systems;
c. electrical and electronic control systems;
d. AC and DC electrical propulsion systems.

TOPIC 3 MAINTENANCE AND REPAIR

1. Plan, Schedule and Organise Maintenance and Repairs

a Code of Safe Working Practices for Merchant Seamen;
b permit-to-work systems;
c dangers of entering enclosed spaces;
d dry dock procedures;
e planned maintenance systems;
f temporary and permanent repairs;
g hull and machinery surveys;
h properties of materials.

2. Detect and Identify the Cause of Machinery Malfunctions and Correct Faults

a fault finding and rectification of faults in shipboard mechanical and electrical plant and equipment, including pneumatic and electronic control systems.

TOPIC 4 CONTROLLING THE OPERATION OF THE SHIP AND CARE FOR PERSONS ON BOARD

1. Trim, Stability and Stress

a factors affecting trim and stability, fuel and water ballast;
b effects of damage to and consequent flooding of a compartment on the trim and stability of the ship and appropriate countermeasures.

2. Legislative Requirements

a International convention certificates and documents required to be on board;
b knowledge of the international conventions on Safety of Life at Sea, the Prevention of Pollution from Ships, Standards of Training, Certification and Watchkeeping
c legal powers and responsibilities under national legislation implementing international agreements and conventions;
d an outline knowledge of the Merchant Shipping Act 57 of 1951 and of the Maritime Occupational Safety regulations, 1994;
e full knowledge of the ISM Code;
f Port State Control.

3. Maintain Safety and Security of the Vessel, Crew and Passengers

a precautions against fires or explosions, explosive mixtures and sources of ignition;
b maintenance of fire-fighting, detection and extinguishing systems;
c maintenance of life-saving appliances and equipment including launching appliances;
d knowledge of life-saving appliance regulations;
e ensuring ship is in seaworthy condition prior to sailing, taking into account the nature of the voyage;
f preparation for heavy weather, maintenance of watertight integrity of the hull;
g procedures for the safe and efficient operation in the UMS mode.

4. Emergency Situations and Damage Control

a actions to protect and safeguard all persons on board in emergencies;
b principles and methods of fire prevention, detection and extinction in all areas of a ship;
c principles of structural fire protection;
d a thorough knowledge of ship construction;
e damage control plans;
f organisation, training and control of fire, abandon ship and damage control parties;
g actions to limit damage following fire, explosion, collision or grounding;
h functions and use of life-saving appliances;
i pollution prevention - action in response to a pollution incident - SOPEP manual;
j procedures for operating main machinery under emergency conditions.

5. Management of Personnel

a effective management, organisation and training of engine department personnel.

Second Engineer Officer and Chief Engineer Officer -
Ships less than 3 000 kW
(Chief Engineer Officer (Port Operations) and Chief Engineer Officer less than 750 kW Port Operations.)

LEVEL 3 ASSESSMENT (ORAL EXAMINATION)

Name of Examiner: .....

Name of Assessor: .....

Name of Candidate: .....

The examiner should make his decision on the competence of the candidate based on the overall level 3 assessment (oral examination). However, should a candidate fail to answer important safety related questions, such that ships personnel and or the environment is endangered, the examiner shall fail such candidate.
The candidate shall be asked a minimum of 9 (nine) questions, i.e. at least two questions from topic 1 and 4, at least 1 question from topic 2 and 3 and any 3 others.

LEVEL THREE ASSESSMENT REPORT

TOPIC ONE- Marine Engineering

Number of questions asked: ☐

Competent YES /NO

Weakness
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TOPIC TWO - Electrical, Electronic and Control Engineering

Number of questions asked: ☐

Competent YES / NO

Weakness:
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TOPIC THREE- Maintenance and Repair

Number of questions asked: ☐

Competent: YES / NO

Weakness:
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TOPIC FOUR-Controlling the Operation of the Ship and Care for Persons on Board

Number of questions asked: ☐

Competent: YES / NO

Weakness:
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Date	*Name of examiner*	*Signature of examiner*
	Name of assessor	*Signature of assessor*

THE CANDIDATE HAS: ☐ PASSED ☐ FAILED PENALTY ☐ MONTHS SEATIME

(The level 3 assessment report, oral examination syllabus guideline and examiners Aide Memoire is to be retained for record purposes in the candidates file)