Part A
Course Framework

■ Scope

This **Management Level Course for Marine Engineer Officers (Function 3)** covers the mandatory minimum requirement for approved education and training as provided under Regulation III/2 of the STCW Convention, 1978, as amended for chief engineers and second engineers on ships powered by main propulsion machinery of 3,000 kW propulsion power or more; and to meet the minimum standard of competence specified in Section A-III/2 of the STCW Code under Function: Maintenance and Repair at the Management Level.

This course requires a total of **thirty-two (32)** instructional hours to cover the topics enumerated in Part B – Course Outline.

■ Training Outcomes

To meet the minimum standard of competence to undertake the tasks, duties, and responsibilities at the management level specified under Table A-III/2 (Function 3) in Section A-III/2 of the STCW Code.

Specifically, at the end of the course the trainee must be able to:

- manage safe and effective maintenance and repair procedures;
- detect and identify the cause of machinery malfunctions and correct faults; and
- ensure safe working practices.

■ Entry Standards

Entry to the course is open to Marine Engineer Officers who are holders of a Certificate of Competency (COC) under Regulation III/1 of the STCW Convention, 1978, as amended, and have an approved seagoing service as an Officer in Charge of an Engineering Watch on ships powered by main propulsion machinery of 750kW or more for not less than 12 months.

■ Course Certificate

Upon successful completion of the course, a Certificate of Completion shall be issued certifying a holder's compliance of the mandatory minimum requirements as specified in Regulation III/2 of the STCW Convention, 1978, as amended, and met the minimum standard of competence under Table A-III/2 (Function 3) in Section A-III/2 of the STCW Code.

■ Course Intake Limitation

The number of trainees shall not exceed twenty-four (24) per class.

■ Staff Requirements

The course must have an Instructor and Assessor with a valid Certificate of Accreditation as Instructor and Assessor respectively for Function 3 of Management Level Course for Marine Engineer Officers issued by the Administration.

Additionally, the Supervisor of training and assessment may be assumed by the training manager, training director or any person designated by the MTI. It shall be required that he/she has full understanding of the training program and the specific objectives for this training course, and has undergone IMO Model Course 6.09 and IMO Model Course 6.10. On the supervision in the conduct of assessment, he/she shall have full understanding of the assessment system, assessment methods and practice, and has undergone IMO Model Course 3.12.

■ Assessment

In determining the achievement of the required competence in Column 1 of Table A-III/2 under the Function: “Maintenance and Repair at the Management Level”, the assigned assessor shall be guided by the Intended Learning Outcomes stipulated in the Course Syllabus and the assessment tasks enumerated in the Assessment Plan.

■ Teaching Facilities and Equipment

For the theoretical aspect of the course, lectures and demonstrations shall be held in a classroom with a set of functional audio-visual equipment. The classroom must have an area of at least 42 square meters (sqm) with no side less than 5 meters and has no structural obstruction. If the classroom is less than 42 sqm, the number of trainees that can be accommodated will be computed based on the 1.75 sqm area per trainee requirement, provided that no side shall be less than 5 meters.

For the conduct of practical exercises and assessment, the following training facilities and equipment shall be available:

Items	Quantity
● Full Mission Engine Room Simulator capable of simulating a realistic environment for detecting and identifying the cause of machinery malfunctions and correcting faults.	1 full mission engine room simulator + 5 workstations

• Steam system (Steam Trap)	4 units
• Auxiliary machineries (Centrifugal or gear pump)	4 units
• Main propulsion (Small cylinder liner, piston, connecting rod and pistons)	1 set
• Generator and distribution system (Circuit Breaker)	4 sets
• Dye Penetrant Testing Equipment	4 sets
• Instructor's Console/station capable of controlling the simulators or computer sets	1 console/station
• A briefing/debriefing room equipped with playback system separate from the simulator room	1 room

Notes:

1. *Engine room simulator equipment shall be compliant with the performance standards as specified in Section A-I/12 Paragraph 1 and must be capable of simulating a main and auxiliary machinery system as specified under Section B-I/12 Paragraph 73.*
2. *The required number of equipment is sufficient for the maximum intake limitation of 24 trainees following the prescribed workstation-to-trainee ratio of 1 full mission: 4 trainees and man-machine ratio of 1:6.*
3. *Required equipment to be used by the instructor during the demonstration is already included in the specified quantity.*
4. *All equipment must be labeled with MTI's name.*
5. *In addition to the required training equipment, the following must be available and permanently marked "**FOR EMERGENCY PURPOSES USE ONLY**" and must be placed in an accessible area:*
   - *First aid kit;*
   - *Stretcher;*
   - *Resuscitation kit with oxygen; and*
   - *Suction unit.*

■ Teaching Aids (A)

A1 Visual Presentations

A2 Training videos related to the topics

Note: When using videos and images from external sources, the MTI shall ensure that these are obtained from reliable sources, deliver accurate information, are of high-resolution quality, adhere to

educational or industry standards, and in accordance with the approved criteria established by the Accreditation Division. Appropriate references/acknowledgements shall be indicated in the presentation slides.

A3 Various Manuals and Checklist

- Sample Operation/Manufacturer's Manual
- Sample checklist and permit to work
- Sample Planned Maintenance System (PMS)

A4 Exercise Sheets

A4.1. Plan maintenance activities, including statutory and class verifications of main propulsion, steam system, generator and distribution system, and auxiliary machineries

A4.2. Plan repair activities of main propulsion, steam system, generator and distribution system, and auxiliary machineries, including statutory and class verifications

A4.3. Manage safe and effective maintenance and repair procedures of main propulsion, steam system, generator and distribution system, and auxiliary machineries

A4.4 Monitor the adherence to safe working practices of any particular engine room maintenance or repair activity

A4.5 Detect machinery malfunctions by comparing the actual operating condition against the normal operating condition and other methods to locate faults

A4.6 Decide on appropriate actions to take to correct faults and prevent damage

A4.7 Supervise the inspection of the equipment

A4.8 Decide the necessary adjustment of the equipment

A4.9 Decide on the appropriate maintenance and repair of machineries and equipment

■ IMO References (R)

R1 *International Convention on Standards of Training, Certification and Watchkeeping (STCW) for Seafarers 1978, as amended,* (latest edition). International Maritime Organization.

R2 *International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended (latest edition).* International Maritime Organization.

R3 *Noise Levels on Board Ships Code (latest edition).* International Maritime Organization.

R4 *Code of Safe Working Practices (latest edition).* Routledge

Note: MTIs may use additional references as deemed necessary to meet the intended learning outcomes.

■ Bibliography (B)

B1 Osbourne, A., & Hunt, E. C. (latest edition). *Modern Marine Engineer's Manual.* Cornell Maritime Press, New York.

B2 Maritime Coastguard Agency. (latest edition). *Code of Safe Working Practices for Merchant Seamen.* The Stationery Office, UK.

B3 International Association of Classification Societies (IACS) (latest edition*). Guidelines for Coatings Maintenance and Repairs*. London, Witherby & Co. Ltd.

B4 House, D.J., (latest edition). *Dry-Docking & Shipboard Maintenance: A Guide to Industry.* Witherby.

B5 Raj, B. et al. (latest edition). *Practical No-Destructive Testing*. Woodhead Publishing.

Note: The MTI may choose books from the above bibliography, or they may use the latest edition of other references provided that their contents will address the required learning outcomes. Electronic publications may be accepted as alternatives to printed copies of the latest editions and must be sourced from authorized publishers.