Part A
Course Framework

■ Scope

This **Management Level Course for Marine Engineer Officers (Function 4)** covers the mandatory minimum requirement for approved education and training as provided for 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 or more; and to meet the minimum standard of competence specified in Section A-III/2 of the STCW Code under Function: Controlling the Operation of the Ship and Care for Persons On Board at the Management Level.

This course requires a total of **ninety-one (91)** 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 4) in Section A-III/2 of the STCW Code.

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

- control trim, stability and stress;
- monitor and control compliance with legislative requirements and measures to ensure safety of life at sea, security and protection of the marine environment;
- develop emergency and damage control plans and handle emergency situations;
- maintain safety and security of the vessel, crew and passengers and the operational condition of life-saving, fire-fighting and other safety systems; and
- use leadership and managerial skills.

■ 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 4 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 for Function 4 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: "Controlling the Operation of the Ship and Care for Persons on Board 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 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 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
Facilities and Equipment	
● Full Mission Engine Room Simulator capable of simulating a realistic environment for the following STCW competences under Table A-III/2: – control trim, stability and stress; – maintain safety and security of the vessel, crew and passengers and the operational condition of life-saving, fire-fighting and other safety systems; – develop emergency and damage control plans and handle emergency situations; and – use Leadership and Managerial Skill.	1 full mission engine room simulator and 5 workstations
• 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 workstations including the full mission engine room is sufficient for the maximum intake of 24 trainees following the prescribed full ERS/workstation-to-trainee ratio of 1:4.*
3. *All equipment must be labeled with MTI's name.*
4. *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 Sample Emergency and Damage Control Plans

A4 Sample Safety Management System (SMS) Manual

A5 Sample Planned Maintenance Systems (PMS) Manual

A6 Sample Contingency Plan

A7 Exercise Sheets

A7.1 Apply the appropriate measure to maintain the stability and stress conditions within safety limits at all times during operation

A7.2 Decide on the appropriate countermeasures to be taken taking into consideration the IMO recommendations about ships stability related to issues onboard

A7.3 Use IMO recommendations about ships stability related to issues onboard

A7.4 Monitor the validity of certificates of surveyed items and equipment

A7.5 Monitor the compliance with the requirements and responsibilities with the International Convention on Load Lines, 1966, as amended, International Convention for the Safety of Life at Sea, 1974, as amended, International Convention for the Prevention of Pollution from Ships, as amended, International Health Regulations, and international instruments affecting the safety of the ship, passengers, crew and cargo

A7.6 Apply the appropriate methods and aids to prevent pollution of the marine environment by ships

A7.7 Develop emergency and damage control plans based on the results of the evaluation

A7.8 Evaluate the applicability of the established emergency and damage control plans in relation to ship’s construction in a given scenario

A7.9 Evaluate the effectiveness of the methods and aids for fire prevention, detection, and extinction in accordance with emergency procedures on board

A7.10 Evaluate the effectiveness of the functions and proper use of life-saving appliances on board a ship in accordance with emergency procedures on board

A7.11 Supervise the conduct of a planned testing and maintenance of life-saving appliances, fire detection, alarms, fire-fighting and other safety systems

A7.12 Plan fire and abandon ship drills

A7.13 Apply appropriate measures to be taken based on the prepared contingency plan

A7.14 Apply appropriate measures to be taken to limit damage and salve the ship

A7.15 .1 Use leadership and managerial skills

A7.15 .2 Use leadership and managerial skills

A8 Sample Compliance Certificates

A9 Trim and Stability booklet

A10 Oil Record Book (ORB)

A11 Garbage Record Book (GRB)

A12 Ozone Depleting Substances Logbook (ODS)

■ 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 *International Convention on Load Lines, 1966, as amended (lates edition).* International Maritime Organization.

R4 *International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) (latest edition).* International Maritime Organization.

R5 *International Health Regulations, (latest edition).* World Health Organization.

R6 *Maritime Labour Convention, (latest edition).* International Maritime Organization.

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

■ Bibliography (B)

B1 Embleton, W., & Jackson, L. (latest edition). *Applied Heat (Vol.3*). Thomas Reed.

B2 Russell, P. A., & Stokoe, E. A. (latest edition). *Ship Construction for Marine Engineers* (7th ed., Vol. 5). Bloomsbury Publishing.

B3 Taylor, D. A. (latest edition). Merchant ship construction. Institute of Marine Engineers.

B4 Eyres, D. J. (latest edition). *Ship construction*. Butterworth-Heinemann.

B5 Pursey, H. J. (latest edition). *Merchant ship construction*. Ferguson Brown & Son.

B6 Munro-Smith, R. (latest edition). Ship's naval architecture. Institute of Marine Engineers.

B7 Taggart, R. (latest edition). *Ship design and construction*. Sname, New York.

B8 Tanker Structure Co-Operative Forum. (latest edition). *Guidance manual for tanker structures*. Witherby & Co. LTD.

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.