



भारत सरकार / GOVERNMENT OF INDIA
पत्तन, पोत परिवहन और जलमार्ग मंत्रालय
MINISTRY OF PORTS, SHIPPING AND WATERWAYS
समुद्रीय प्रशासन महानिदेशालय, मुंबई
DIRECTORATE GENERAL OF MARITIME ADMINISTRATION, MUMBAI

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DGMA EAC Branch Circular No.49 of 2026

Subject: Preparatory courses for MEO and ETO grade of CoC examinations, reg.

References:

- MS Notice No.6 of 2000
- MS Notice No.13 of 2007
- STCW Circular No. 8 of 2012
- STCW Circular No. 9 of 2012
- DGS [EAC] Circular No. 02 of 2022
- Training Circular No. 3 of 2019

Part A

I. Background

- The Directorate General of Maritime Administration (DGMA) presently prescribes structured preparatory courses to assist candidates in preparing for the Certificate of Competency examinations for the grades of Chief Engineer Officer and Second Engineer Officer (Motor/Steam), conducted through approved Maritime Training Institutes (MTIs).
- The existing syllabus for these preparatory courses was last comprehensively revised some years ago and has, since then, been updated only in a piecemeal manner. In the intervening period, there have been significant developments in ship technology, statutory requirements, and international training standards, that are not adequately reflected in the current course content.

II. STCW Requirements

Regulation I/6 of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978, as amended, requires that the training and assessment of seafarers be structured in accordance with the provisions of the Convention and the STCW Code.

Further, Regulation I/11 of the Convention requires certificate holders to demonstrate continued professional competence. Regulation III/1 prescribes the minimum standards of competence for Officers in Charge of an Engineering Watch, Regulation III/2 specifies the standards for Chief Engineer Officers and Second Engineer Officers, and Regulation III/6 prescribes the minimum standards of competence for Electro-Technical Officers.

Sections A-I/6, A-III/1, A-III/2 and A-III/6 of the STCW Code require candidates to acquire the prescribed knowledge, understanding and proficiency, and to demonstrate the competencies specified therein, prior to the issuance of the relevant Certificate of Competency.

III. Revision of the Syllabus for existing preparatory courses & assess the need for preparatory course for MEO Class IV and the ETO grade of examinations.

The Directorate General of Maritime Administration (DGMA), in exercise of the powers conferred under the Merchant Shipping Act, 2025 as amended, constituted a Technical Committee comprising representatives from the DGMA, domain experts from various industry organizations and professional bodies and approved Maritime Training Institutes (MTIs) to undertake the following:

- (a) revisit the need for preparatory courses for different grade(s) of Engg./ETO CoC examinations;
- (b) review existing training framework and course syllabi for Marine Engineer Officers and Electro-Technical Officers.

1. Review of preparatory course syllabus for Chief Engineer Officers [MEO Class I] and Second Engineer Officers [MEO Class II] on ships powered by main propulsion machinery of 3000 kW and above.

The Technical Committee has reviewed the feedback received from examiners, MTIs, ship owners/managers, recently qualified officers, and has identified the following factors that necessitate a revision of the preparatory course syllabus for the MEO Class I and MEO Class II grades:

- Amendments to the STCW Convention and Code, and updated IMO Model Courses, which require closer alignment of shore-based preparatory training with current competence tables.
- Widespread adoption of electronically controlled, dual-fuel, and hybrid propulsion systems, requiring updated technical content on engine management systems, automation, and control engineering.
- Growing use of alternative and low-carbon fuels (LNG, methanol, ammonia, biofuels) and the associated safety, bunkering, and operational procedures.
- Statutory and environmental developments, including MARPOL Annex VI updates, EEXI and CII requirements, and their implications for engine room operations and record-keeping.
- Increasing shipboard digitalization, cyber-security exposure, and condition-based/predictive maintenance practices.
- Observed trends in examination performance, including subject-wise pass percentages, indicating specific areas of candidate weakness that the current syllabus does not adequately address.
- The need to strengthen engine room resource management, leadership, and human element components in line with modern competency-based assessment.

The Committee proposed substantial revision to the preparatory course syllabus for the Chief Engineer Officer and Second Engineer Officer grades to include updated technical modules, revised course duration as detailed in the Revised Syllabus attached as Annexure's to this Circular.

2. Review of Preparatory Course requirement for Officer on Engineering Watch (MEO Class IV) & Electro-Technical Officer (ETO) CoC Examinations

The Technical Committee, after the detailed review, has submitted the following observations:

1. The candidates, especially those at the entry-level viz. MEO Class IV and ETO often struggle with initial Certificate of Competency (CoC) exams due to inadequate practical training quality, gaps in onboard vessel exposure, and lack of mentorship after completing their pre-sea courses. These candidates, after completing the minimum mandatory sea service, appear for the Certificate of Competency examinations without adequate academic revision, structured preparation, or post-sea-service technical orientation. Rote learning fails candidates during oral assessments conducted, when deep fundamental comprehension is tested
2. The Committee observed that a significant number of candidates require considerable time and multiple attempts to successfully complete the examinations, achieve the necessary level of competency, before a CoC can be awarded in accordance to the STCW Convention and Code and the Merchant Shipping (STCW) Rules, 2014, as amended.
3. The Committee recognized the need to strengthen the existing training framework to effectively bridge the gap between practical shipboard experience and the knowledge, understanding, proficiency, and competencies prescribed under the STCW Convention and the STCW Code.
4. The non-mandatory preparatory courses and the E-learning modules have not been successful in effectively stemming the failing standards of the entry level CoC examination candidate. The Committee emphasized the need for a comprehensive revision to incorporate the latest amendments to the STCW Convention and the STCW Code, the technological advancements, emerging innovations, digitalisation, automation, environmental sustainability, the human element, cyber risk management, and other developments in international maritime standards and industry best practices.

The DGMA has accepted the Committee's recommendation for introduction of mandatory preparatory courses for candidates appearing for the MEO Class-IV and Electro-Technical Officer (ETO) Certificate of Competency examinations. The revised framework is intended to strengthen candidates' technical knowledge, professional competence, and examination preparedness, thereby enhancing compliance with the STCW Convention and improving the quality of certificated marine engineering officers.

Part B

IV. Introduction of MEO Class-IV Preparatory Course

Recognizing, the need to have a structured learning programme for the candidates who after completion of the pre-sea training, have undergone the mandatory shipboard training and are eligible to appear for the Certificate of Competency as Officer in charge of an Engineering watch [MEO Class IV], the Directorate General of Maritime Administration, as recommended by the technical committee, hereby introduces a one-month Preparatory Course for the MEO Class-IV, Certificate of Competency Examination candidates.

The Preparatory Course shall be mandatory for the following categories of candidates:

- a) all candidates applying for eligibility assessment or intending to appear for the MEO Class-IV Certificate of Competency written and/or oral examination for the first time on or after 01 January 2027; and
- b) candidates who have not appeared for either written or oral examinations for any of the functions of the MEO Class-IV grade examination, in the calendar year 2026, and intend to appear written or oral examination on or after 01 January 2027.

Successful completion of the Preparatory Course shall be a pre-requisite for eligibility to appear in the MEO Class-IV Certificate of Competency examination for the above categories of candidates.

The detailed course framework and syllabus of the Preparatory Course are enclosed as **Annexure-I** to this Circular.

V. Revision of Preparatory Courses for Chief Engineer Officer [MEO Class I] and Second Engineer Officer [MEO Class II] on ships powered by main propulsion machinery of 3000 kW and above.

The Technical Committee had undertaken a comprehensive review of the existing preparatory course syllabi for the MEO Class-II and MEO Class-I Certificate of Competency examinations.

The revised syllabi have been aligned with the competency requirements prescribed under Regulation III/2 of the STCW Convention, Section A-III/2 of the STCW Code, and the associated Tables of Competence, taking into account the latest technological advancements, digitalization, automation, environmental sustainability, the human element, cyber risk management, and other developments in international maritime standards and industry best practices.

The DGMA has accepted the recommendations of the Committee and the preparatory course duration has been altered as under:

Name of the Course	Existing Duration	Revised Duration	Effective Date
MEO Class-II Preparatory Course	Four Months	Three Months	01 January 2027
MEO Class-I Preparatory Course	Two Months	No Change (Two Months)	01 January 2027

Accordingly, the following shall apply:

1. The revised MEO Class-II Preparatory Course duration of three months shall be applicable to all batches commencing on or after 01 January 2027.
2. Candidates admitted to the MEO Class-II Preparatory Course prior to 01 January 2027 shall continue under the existing four-month course duration and syllabus.
3. All Maritime Training Institutes (MTIs) approved by the Directorate General of Shipping and conducting MEO Class-I and MEO Class-II Preparatory Courses shall adopt the revised syllabi with effect from 01 January 2027.

4. MTIs shall revise their curriculum, lesson plans, teaching schedule, training material, and internal assessment methodology to ensure compliance with the revised syllabus and course duration.
5. The revised course frameworks and syllabi for the MEO Class-II and MEO Class-I Preparatory Courses are enclosed as **Annexure-II** and **Annexure-III**, respectively.

VI. Introduction of Electro-Technical Officer (ETO) Preparatory Course

The Technical Committee reviewed the existing training framework for Electro-Technical Officers prescribed under Regulation III/6 of the STCW Convention, the Merchant Shipping (Standards of Training, Certification and Watchkeeping for Seafarers) Rules, 2014 and the applicable Orders/Circulars/Notices issued by the DGMA. The Committee observed that ETO candidates generally do not undergo any structured academic revision or technical orientation after completion of the mandatory shipboard training.

The Committee further observed that the absence of a structured preparatory course has adversely affected the performance of candidates in the Electro-Technical Officer (ETO) Certificate of Competency written and oral examinations.

Accordingly, the Directorate General of Maritime Administration hereby introduces a one-month Preparatory Course for the Electro-Technical Officer (ETO) Certificate of Competency Examination.

The implementation schedule of the mandatory preparatory course for the ETO candidates shall be applicable as under:

- a) all candidates applying for assessment or appearing for the Electro-Technical Officer (ETO) Certificate of Competency written and/or oral examination for the first time on or after 01 January 2027; and
- b) candidates who have not appeared for either written or oral examinations of the Electro-Technical Officer (ETO) Certificate of Competency examination after completion of Eligibility assessment, in the last calendar year 2026, and intend to appear for the examination on or after 01 January 2027.

Successful completion of the Preparatory Course shall be a prerequisite for eligibility to appear in the Electro-Technical Officer (ETO) Certificate of Competency examination for the above categories of candidates.

The detailed course framework and syllabus of the Preparatory Course are enclosed as **Annexure-IV** to this Circular.

VII. Approval of Preparatory courses for MEO Class-IV and ETO grade

The Training Branch of the Directorate General of Maritime Administration shall issue separate Course Approval Guidelines governing, *inter alia*:

- infrastructure requirements;
- faculty qualifications and requirements;
- course duration and training hours;
- assessment and evaluation methodology;
- attendance requirements;

- quality assurance standards; and
- other criteria for the grant and continuation of course approval.

Maritime Training Institutes (MTIs) approved by the Directorate General of Maritime Administration for conducting MEO Preparatory Courses and intending to conduct the MEO Class-IV and Electro-Technical Officer (ETO) Preparatory Courses, may make the necessary arrangements to obtain approval for the respective courses and commence training from 01 November 2026, thereby enabling eligible candidates to comply with the mandatory preparatory course requirements applicable from 01 January 2027.

VIII. The candidates are required to attend the preparatory courses as mentioned above mandatorily. The e-learning module for the MEO Class IV candidates shall not be mandatory, but all CoC exam candidates are encouraged to avail the e-learning facility offered by the DGMA for enhancing their knowledge, self-assess and track their progress. The candidates who are onboard can continue to learn, update their knowledge at their convenience through e-learning facility.

This Circular is issued with the approval of the Competent Authority.



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Dy.Chief Surveyor cum Sr.DDG(Tech)
DGMA

To

1. The Principal Officers, Mercantile Marine Department, Mumbai/Kolkata/Chennai/Kandla/Kochi.
2. The Surveyor-in-Charge, Mercantile Marine Department, Goa/Jamnagar/Port Blair/Visakhapatnam/Tuticorin/Noida/Haldia/Paradip/Mangalore
3. Indian National Shipowner's Association (INSA), Mumbai.
4. Indian Coastal Conference Shipping Association (ICCSA), Mumbai
5. Institute of Marine Engineers (India)
6. The Chief Surveyor with the Govt.of India
7. Engineering Wing
8. Training Branch
9. Hindi cell
10. Computer cell

Syllabus for Electro-Technical Officer (ETO) Preparatory Course

(Duration: One Month – 4 Weeks, 20 Working Days, 120 Contact Hours)

The syllabus of the Electro-Technical Officer (ETO) Preparatory Course shall be designed to prepare candidates for the Written and Oral Examinations leading to the issue of the Electro-Technical Officer Certificate of Competency (CoC) in accordance with the requirements of Regulation III/6 and Section A-III/6 of the STCW Convention, 1978, as amended.

The course shall be conducted as a four-week, fully offline programme, with emphasis on classroom instruction and practical troubleshooting. A minimum of two hours of supervised practical training shall be conducted each working day, directly linked to the theoretical subjects covered on that day.

The course shall comprise the following subjects:

1. Marine Electrical Engineering (28 Hours)

Fundamentals of electrical engineering; DC and AC circuits; three-phase systems and electrical measurements; electrical machines, including generators, alternators, transformers and motors; marine electrical power generation and distribution systems; main and emergency switchboards; synchronizing, load sharing and power management systems; protective devices and electrical safety; battery systems, charging arrangements and uninterruptible power supply (UPS) systems; electrical systems of deck machinery, including mooring winches, windlasses and cranes; GMDSS power supply arrangements; internal communication systems; public address (PA) systems; sound-powered telephones; intrinsically safe (Ex-i) and explosion-proof (Ex-d) equipment; and hazardous area electrical installations.

2. Marine Electronics (16 Hours)

Semiconductor devices and electronic components; analogue and digital electronics; power electronic devices and their applications; electronic control circuits; microprocessors and microcontrollers; communication and navigation equipment interfaces; electronic fault diagnosis and testing techniques; digital ship sensors; electronic data loggers; smart ship technologies; Voyage Data Recorder (VDR) interfaces; and networked electronic equipment.

3. Automation and Control Engineering (18 Hours)

Principles of automatic control systems; sensors, transmitters and actuators; Programmable Logic Controllers (PLCs); automation of main engines and auxiliary machinery; boiler automation systems; alarm, monitoring and control systems; Integrated Automation Systems (IAS); Power Management Systems (PMS); Operational Technology (OT) architecture; cyber security of OT systems; advanced PLC diagnostics; Modbus and

Profibus troubleshooting; Variable Frequency Drives (VFDs); harmonic analysis; physical network isolation; and stand-alone OT recovery procedures.

4. High Voltage Technology (12 Hours)

High-voltage generation and distribution systems on board ships; construction and operation of high-voltage equipment; high-voltage protection systems; safety precautions and the use of personal protective equipment (PPE); isolation procedures; Permit-to-Work (PTW) systems; testing and maintenance of high-voltage installations; electrical safety for methanol fuel systems, ammonia fuel systems and hydrogen fuel cells; and Battery Energy Storage Systems (BESS) and hybrid propulsion electrical systems.

5. Instrumentation and Control Systems (10 Hours)

Principles of marine instrumentation; measurement of pressure, temperature, level and flow; speed and position sensing devices; calibration and testing of instruments; signal transmission and conditioning; instrument fault diagnosis; Continuous Emission Monitoring Systems (CEMS); cryogenic instrumentation; cryogenic sensor calibration; cargo automation; and decarbonization automation systems.

6. Electrical Maintenance and Troubleshooting (18 Hours)

Planned maintenance of electrical and electronic equipment; interpretation of electrical drawings and circuit diagrams; testing using electrical measuring instruments; insulation resistance and continuity testing; maintenance and troubleshooting of motors, generators, transformers and switchgear; fault diagnosis in automation and electronic control systems; practical troubleshooting techniques for shipboard electrical equipment; advanced PLC troubleshooting; VFD commissioning; harmonic measurement; OT network fault diagnosis; VDR communication testing; sensor loop calibration; electrical fault simulation; and integrated automation system troubleshooting.

7. Shipboard Safety, Environmental Protection and Maritime Regulations (10 Hours)

Safe working practices on board ships; electrical safety procedures; Lock-Out/Tag-Out (LOTO) procedures; fire prevention and firefighting related to electrical installations; the requirements of SOLAS, MARPOL, the STCW Convention, the ISM Code and the ISPS Code; pollution prevention and environmental protection measures; occupational health and safety requirements; workplace culture on board; prevention of violence and harassment; the human element; cyber risk management; alternative fuel safety; and emerging IMO environmental regulations.

8. Written and Oral Examination Preparation (8 Hours)

Numerical problem-solving; practice of previous examination papers; case studies on shipboard electrical and electronic systems; mock written examinations; mock oral examinations and viva voce; and discussion on practical shipboard fault-finding and troubleshooting scenarios.

Practical Training

Practical training shall be integrated throughout the course and shall include electrical measurements; interpretation of electrical drawings; insulation resistance and continuity testing; testing and maintenance of motors, generators, transformers and switchgear; VFD parameter setting; switchboard operations; protection systems; PLC familiarization and programming; GMDSS power supply testing; VDR testing; automation and instrumentation exercises; high-voltage safety demonstrations; fault diagnosis of deck machinery; reefer electrical troubleshooting; electronic circuit testing; soldering techniques; smart sensor diagnostics; CEMS calibration; and practical fault diagnosis using laboratory equipment or simulators.

The Maritime Training Institute (MTI) shall ensure that all practical sessions are conducted using appropriate instruments, equipment and training aids. Wherever it is not practicable to demonstrate practical exercises using actual equipment, AI-enabled visual demonstrations, virtual simulations and instructional videos may be used to familiarize candidates with the relevant equipment, procedures and practical applications.