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Marine Guidance (2 /2022)

AMENDMENTS TO MARINE GUIDANCE (6/2021) RELATING TO GUIDANCE FOR MARITIME EDUCATION & TRAINING, EXAMINATION AND CERTIFICATION FOR SEAFARERS

Applicable to: **Maritime Training Institutes, Maritime Training Centres, Instructors, Assessors, Examiners and Seafarers**

References:

(a) **Myanmar Merchant Shipping Act, Section 21;**

(b) **Notification (108/2012) (Rules for granting of certificates of competency and Certificates of Proficiency of Masters, Officers and Ratings);**

(c) **International Convention on Standards of Training, Certification and watchkeeping for Seafarers, 1978, as amended (STCW); and**

(d) **Marine Guidance (6/2021) dated on 22 October 2021.**

Summary

This Marine Guidance provides subsequent amendments to the annexes of Marine Guidance (6/2021) concerning the system of maritime education & training, examination and certification for Marine Engineer Officers, Electro-Technical Officer, Electro-Technical Rating and Rating Engine.

1. The Department of Marine Adiministration (DMA) has issued Marine Guidance (6/2021) relating to "Guidance for maritime education & training, examination and certification for seafarers" on 22 October 2021.

2. This Marine Guidance serves to provide the subsequent amendments to ANNEX (E.1.1), ANNEX (E.2.1), ANNEX (E.3.1), ANNEX (E.3.2), ANNEX (E.4.1), ANNEX (E.5.1), ANNEX (E.6.1), ANNEX (EP.1.1), ANNEX (EP.2.1), ANNEX (EP.4.1), ANNEX (EP.4.2) and Definitions and Abbreviations of Marine Guidance (6/2021) concerning the system of maritime education & training, examination and certification for Marine Engineer Officers, Electro-Technical Officer, Electro-Technical Rating and Rating Engine, the text of which is set out in the Annexes of the present Marine Guidance.

3. The DMA shall administer, supervise and monitor every stage of implementation to ensure that the standards set by this Marine Guidance are fully met.

4. This Marine Guidance shall enter into force on the date of issue.

Dr. Ko Ko Naing
Director General (Acting)

Ammendments to ANNEX (E.1.1) of Marine Guidance (6/2021)

System of Maritime Education & Training, Examination and Certification for Marine Engineer Officer Class I - Certificate of Competency (Chief Engineer Officer on a seagoing ships powered by main propulsion machinery of 3,000 kW propulsion power or more) (STCW Convention 1978, as amended, Regulation III/2)

Paragraph 3

1. It is replaced the text of paragraph 3(C) with:

"after successfully completed the assessment, have to sit Written Examination for the following Marine Engineering Technology Subjects conducted by the Board of Examiners (BoE) at pre-determined place:

(1) Marine Engineering Knowledge (General);

(2) Marine Engineering Knowledge (Motor);

(3) Marine Electro-technology; and

(4) Maritime Convention, Naval Architecture and Ship construction."

Paragraph 5

2. It is replaced the text of paragraph 5(B) with:

"(B) Engine Room Resource Management Course (Leadership and Managerial Skills)"

3. The table teaching hours, examination mode & marking system for Marine Engineer Officer class I CoC course and examination (for old MET system candidates) is replaced as follow:

Subjects	Teaching Hours	Demonstrating competence		
		Method	Hours	% Pass
Marine Engineering Knowledge (General)	245	Written Assessment (BoE)	3	50
Marine Engineering Knowledge (Motor)	50		3	50
Marine Electro-technology	205		3	50
Maritime Convention, Naval Architecture and Ship Construction	160		3	50
Mechanics & Hydro-Mechanics	55	Written Assessment (BoE)	3	50
Thermodynamics & Heat Transmission	55		3	50
Mathematics	10		3	50
Marine Engineering Technology Subjects		Oral Assessment (DMA)		90
Total Teaching Hours	780			

Ammendments to ANNEX (E.2.1) of Marine Guidance (6/2021)

System of Maritime Education & Training, Examination and Certification for Marine Engineer Officer Class II - Certificate of Competency (Second Engineer Officer on a seagoing ships powered by main propulsion machinery of 3,000 kW propulsion power or more) (STCW Convention 1978, as amended, Regulation III/2)

Paragraph 1

1. In paragraph 1(B) the word "750 kW" is replaced with "3000kW".

Paragraph 2

2. It is replaced the text of paragraph 2 with:

"after successfully completed the assessment, have to sit Written Examination for the following Marine Engineering Technology Subjects conducted by the Board of Examiners (BoE) at pre-determined place:

(1) Marine Engineering Knowledge (General);

(2) Marine Engineering Knowledge (Motor);

(3) Marine Electro-technology; and

(4) Maritime Convention, Naval Architecture and Ship construction."

Paragraph 5

3. It is replaced the text of paragraph 5(B) with:

"(B) Engine Room Resource Management Course (Leadership and Managerial Skills)"

4. The table teaching hours, examination mode & marking system for Marine Engineer Officer class II CoC course and examination is replaced as follow:

Subjects	Teaching Hours	Demonstrating competence		
		Method	Hours	% Pass
Marine Engineering Knowledge (General)	245	Written Assessment (BoE)	3	50
Marine Engineering Knowledge (Motor)	50		3	50
Marine Electro-technology	205		3	50
Maritime Convention, Naval Architecture and Ship Construction	160		3	50
Mechanics & Hydro-Mechanics	55	Written Assessment (BoE)	3	50
Thermodynamics & Heat Transmission	55		3	50
Mathematics	10		3	50
Marine Engineering Technology Subjects		Oral Assessment (DMA)		90
Total Teaching Hours	780			

Ammendments to ANNEX (E.3.1) of Marine Guidance (6/2021)

System of Maritime Education & Training, Examination and Certification for Marine Engineer Officer Class III - Certificate of Competency (Officer in charge of an engineering watch on a seagoing ship powered by main propulsion machinery of 750 kW propulsion power or more)

(STCW Convention 1978, as amended, Regulation III/1)

Paragraph 4

1. It is replaced the text of paragraph 4(C) with:

"have to sit written Examination, which is held for the MMU candidates after graduated with Marine Engineering degree, in the same year unless approved by the DMA. The Written Examination, comprise with the following Marine Engineering Technology Subjects, will be conducted by the Board of Examiners (BoE) at pre-determined place:"

(1) Marine Engineering Knowledge (General);
(2) Marine Engineering Knowledge (Motor);
(3) Marine Electro-technology; and
(4) Maritime Convention, Naval Architecture and Ship Construction.

2. It is replaced the text of paragraph 4(H)(2) with:

"(2) Engine Room Resource Management Course (Leadership and Teamworking Skills)"

Paragraph 5

3. It is added the text of paragraph 5(B) with:

"(Candidates holding B.E(N.A), B.E(M.M) have successfully completed the Written Examination for the Basic Marine Engineering Science Subjects during their education and training period at the MMU)"

4. It is replaced the text of paragraph 5(E) with:

"after successfully completed the approved seagoing service, have to sit the Written Examination for the following Marine Engineering Technology Subjects conducted by the Board of Examiners (BoE) at pre-determined place:"

(1) Marine Engineering Knowledge (General);
(2) Marine Engineering Knowledge (Motor);
(3) Marine Electro-technology; and
(4) Maritime Convention, Naval Architecture and Ship Construction

5. It is replaced the text of paragraph 5(H)(2) with:

"(2) Engine Room Resource Management Course (Leadership and Teamworking Skills)"

Paragraph 6

6. It is replaced the text of paragraph 6(E) with:

"after successfully completed the approved seagoing service, have to sit the Written Examination for the following Marine Engineering Technology Subjects conducted by the Board of Examiners (BoE) at pre-determined place:"

(1) Marine Engineering Knowledge (General);
(2) Marine Engineering Knowledge (Motor);
(3) Marine Electro-technology; and
(4) Maritime Convention, Naval Architecture and Ship Construction

7. It is replaced the text of paragraph 6H)(2) with:

"(2) Engine Room Resource Management Course (Leadership and Teamworking Skills)"

Paragraph 7

8. It is replaced the text of paragraph 7(E) with:

"after successfully completed the approved seagoing service, have to sit the Written Examination for the following Marine Engineering Technology Subjects conducted by the Board of Examiners (BoE) at pre-determined place:

(1) Marine Engineering Knowledge (General);
(2) Marine Engineering Knowledge (Motor);
(3) Marine Electro-technology; and
(4) Maritime Convention, Naval Architecture and Ship Construction"

9. It is replaced the text of paragraph 7(H)(2) with:

"(2) Engine Room Resource Management Course (Leadership and Teamworking Skills)"

Paragraph 8

10. It is interchange with 8 (D) and (E) and replaced the text of paragraph (E) as follow:

"(D) have successfully completed the Assessment for the following Marine Engineering Technology Subjects during their education and training period of the approved marine Engineering Knowledge Course at approved Training Centre:

(1) Marine Engineering Knowledge (General);
(2) Marine Engineering Knowledge (Motor);
(3) Marine Electro-technology; and
(4) Maritime Convention, Naval Architecture and Ship Construction.

(E) after successfully completed the approved seagoing service, have to sit Written Examination for the following Marine Engineering Technology Subjects conducted by the Board of Examiners (BoE) at pre-determined place:

(1) Marine Engineering Knowledge (General);
(2) Marine Engineering Knowledge (Motor);
(3) Marine Electro-technology; and
(4) Maritime Convention, Naval Architecture and Ship Construction."

11. It is replaced the text of paragraph 8(H)(2) with:

"(2) Engine Room Resource Management Course (Leadership and Teamworking Skills)"

Paragraph 9

12. It is replaced the text of paragraph 9(E) with:

"after successfully completed the approved seagoing service, have to sit the Written Examination for the following Marine Engineering Technology Subjects conducted by the Board of Examiners (BoE) at pre-determined place:

(1) Marine Engineering Knowledge (General);
(2) Marine Engineering Knowledge (Motor);
(3) Marine Electro-technology; and
(4) Maritime Convention, Naval Architecture and Ship Construction"

13. It is replaced the text of paragraph 9(H)(2) with:

"(2) Engine Room Resource Management Course (Leadership and Teamworking Skills)"

14. The table teaching hours, examination mode & marking system for marine engineer officer class III CoC course and examination is added the Remark text as follow:

"Remarks: For candidates holding B.E.(M.E) does not include the subject of marine engineering technology subject course and examination."

Ammendments to ANNEX (E.3.2) of Marine Guidance (6/2021)

SYLLABUS FOR WRITTEN EXAMINATION OF
Marine Engineer Officer Class III - Certificate of Competency
(Officer in charge of an engineering watch on a seagoing ship powered by main propulsion machinery of 750 kW propulsion power or more)
(Workshop Skill Training Course)
(STCW Regulation III/1)

Function 3, Paragraph 3.3

1. The paragraph (3.3) "BASIC ENGINEERING DRAWING" is added as follow:

"9. Screw Threads and fasteners
- left- and right hand screw threads
- screw thread
- pitach
- outside diameter
- root diameter
- crest
- root
- flank
- lead
- hexagonal nut
- nut, stud and washer assembly

10. Locking and retaining devices
- locking plate
- summands lock-nut
- lock washers
- spring washers
- tab washers
- taper pins

11. Rivetted type fastening
- sketches the following riveted joints:
- single lap
- double lap
- blind screw anchors fasteners

12. Welded connections
- skecches and specified symbol for various welded connections

13. Cams
- constructs cam profiles to give uniform velocities and a dwell period to the cam

14. Bearings
- Plain Bearing
- Ball and Roller Bearings

15. Seals
- bearing seal
- non-rubbing seals
- rubbing seals
- felt seal
- lip seals
- v-ring seal

16. Lubricating of ball and roller bearings
    - ball and roller bearing lubrication
17. Marine Engineering Drawing
    - Connecting Rod and bearing
    - 2 stroke Piston and connecting rod
    - Mechanical libricator
    - fuel valve
    - starting air valve
    - stern tube and tail shaft
    - control valve
    - gear pump
    - high lift safety valve
    - stop valve (piston valve)
    - feed check valve
    - parallel slide stop valve"

Ammendments to ANNEX (E.4.1) of Marine Guidance (6/2021)

System of Maritime Education & Training, Examination and Certification for Marine Engineer Officer Class IV - Certificate of Competency (Chief Engineer Officer on a seagoing ships powered by main propulsion machinery of between 750 kW and 3000 kW propulsion power or more) (STCW Convention 1978, as amended, Regulation III/3)

Paragraph 6

1. It is replaced the text of paragraph 6 (B) with:

   "(B) Engine Room Resource Management Course (Leadership and Managerial Skills)"

2. The table teaching hours, examination mode & marking system for Marine Engineer Officer class IV CoC course and examination is replaced as follow:

Subjects	Teaching Hours	Demonstrating competence		
		Method	Hours	% Pass
Marine Engineering Knowledge (General)	75	Written Assessment (MTC)	3	50
Marine Engineering Knowledge (Motor)			3	50
Marine Electro-technology	53		3	50
Maritime Convention, Naval Architecture and Ship Construction	52		3	50
Total Teaching Hours	180	**Oral Assessment (DMA)**		90

Ammendments to ANNEX (E.5.1) of Marine Guidance (6/2021)

System of Maritime Education & Training, Examination and Certification for Marine Engineer Officer Class V - Certificate of Competency (Second Engineer Officer on a seagoing ships powered by main propulsion machinery of between 750 kW and 3000 kW propulsion power or more) (STCW Convention 1978, as amended, Regulation III/3)

Paragraph 3

2. It is replaced the text of paragraph 3(B) with:

"(B) Engine Room Resource Management Course (Leadership and Managerial Skills)"

Ammendments to ANNEX (E.6.1) of Marine Guidance (6/2021)

System of Maritime Education & Training, Examination and Certification for Electro – Technical Officer (ETO) - Certificate of Competency (serving on a seagoing ships powered by main propulsion machinery of 750 kW propulsion power or more) (STCW Regulation III/6)

WORKSHOP SKILLS TRAINING
(The examination for Marine Electro-Technology Practical and Supporting Knowledge subjects)

Paragraph 1

1. It is replaced and added the text of paragraph 1(A) with:

"Every candidate for certification shall:

(A) hold the B.E. degree in Marine Electrical systems & Electronics or Electrical or Electronics or Mechatronics subjects;

(or)

hold the Electro -Technical Rating (ETR) Certificate of Proficiency, whilst holding the AGTI diploma or technology degree (GTC or B. Tech) in Electrical or Electronics or Mechatronics or B.Sc (physics) or have passed Technical High School (Electrical or Electronics subjects);

(or)

hold the Diploma in Marine Electro-Technology from the Myanmar Mercantile Marine College (MMMC).

(or)

hold the B.E (N.A) or B.E (M.M) or MMMC (Diploma in Marine Technology) or B.E or B.Tech or AGTI or Diploma of Technology in subjects other than Electrical, Electronics and Mechatronics, and candidates holding B.Sc (Maths or Engineering) or have passed BEHS or matriculated with science subjects or THS other than (electrical, electronic) or GCE "O" level or equivalent certificate approved by Ministry of Education and shall have to serve for at least 24 months as approved sea going service in engine department."

WRITTEN AND ORAL PARTS

(The examination for Marine Electro Technology and Supporting Knowledge subjects)
(The examination for Marine Electro-Technology subjects and Supporting Knowledge subject)

Paragraph 1

2. It is replaced the text of paragraph 1(D) with:

"(D) the candidates have successfully completed the Written Examination for the following Marine Electro-Technology subjects conducted by the Board of Examiner (BoE) at pre-determined place:

(1) Electrical, Electronics and Control Engineering; and

(2) Maintenance and repair."

3. It is replaced the text of paragraph 1(G) (2) with:

"(2) Engine Room Resource Management Course (Leadership and Teamworking Skills)"

Paragraph 2

4. It is replaced the word of paragraph 2(B) "10 months" with "8 months"

5. It is replaced the text of paragraph 2(D) with:

"(D) the candidates have successfully completed the Written Examination for the following Marine Electro-Technology subjects conducted by the Board of Examiner (BoE) at pre-determined place:

(1) Electrical, Electronics and Control Engineering; and

(2) Maintenance and repair."

6. It is replaced the text of paragraph 2(G) (2) with:

"(2) Engine Room Resource Management Course (Leadership and Teamworking Skills)"

Paragraph 3

7. It is replaced the text of paragraph 3 with:

"The candidates holding the Electro -Technical Rating (ETR) Certificate of Proficiency, whilst holding the AGTI diploma or technology degree (GTC or B. Tech) in Electrical or Electronics or Mechatronics or B.Sc (physics) or have passed Technical High School (Electrical or Electronics subjects) shall;"

8. It is replaced the text of paragraph 3(D) with:

"(D) the candidates have successfully completed the Written Examination for the following Marine Electro-Technology subjects conducted by the Board of Examiner (BoE) at pre-determined place:

(1) Electrical, Electronics and Control Engineering; and

(2) Maintenance and repair."

9. It is replaced the text of paragraph 3(G) (2) with:

"(2) Engine Room Resource Management Course (Leadership and Teamworking Skills)"

Paragraph 4 (New MET system)

10. The whole paragraph is added as follow:

"4. The candidates who have approved seagoing service of not less than 24 months after holding the Electro-Technical Rating (ETR) Certificate of Proficiency, whilst holding B.E (N.A) or B.E (M.M) or MMMC (Diploma in Marine Technology) or B.E or B.Tech or AGTI diploma or Diploma of Technology in subjects other than Electrical, Electronics and Mechatronics, and candidates holding B.Sc (Maths or Engineering) or have passed BEHS or matriculated with science subjects or THS other than (electrical, electronic) or GCE "O" level or equivalent certificate approved by Ministry of Education shall;

(A) have successfully completed the Workshop Skills Training. The training Course is administered supervised and monitored by the Department of Marine Administration (DMA).

(B) have approved seagoing service of not less than 24 months (have performed as ETO trainee/Electrical Cadet under the supervision of chief engineer officer or qualified engineer officer)

(C) have successfully completed the continuous Assessment for the following Marine Electro-Technology Subjects and Supporting Knowledge Subjects during the period of Electro-Technology Officer (ETO) course at the approved Training Centers:

(1) Electrical, Electronics and Control Engineering;

(2) Maintenance, repair and General Engineering knowledge;

(3) Controlling the operation of the ship and care for persons on board; and

(4) Supporting Knowledge Subjects.

(D) The candidates have successfully completed the Written Examination for the following Marine Electro-Technology subjects conducted by the Board of Examiner (BoE) at pre-determined place:

(1) Electrical, Electronics and Control Engineering; and

(2) Maintenance and repair.

(E) The candidates who have failed in any subject of Written Examination conducted by (BoE) shall have to attempt for failed subject/s only in the subsequent Written Examination/s and shall be successfully completed all subjects within 2 years, which shall be counted at the issued date of BoE Written Examination result, otherwise shall have to attempt for the overdue subjects.

(F) The candidates who have successfully completed in Written Examination shall have to sit the Oral Examination conducted by the Department of Marine Administration (DMA). The candidates who have failed in the Oral Examination shall have to attempt for the Oral Examination in the subsequent Oral Examination/s. The Oral Examination shall be successfully completed within 5 years, which shall be counted at the issued date of course completion certificate.

(G) The candidates shall have successfully completed the following Training Courses after passing the Oral Examination:

(1) Operate and Maintain High-Voltage power systems Course; and

(2) Engine Room Resources Management Course (Leadership and Teamworking Skills)

(H) The Department of Marine Administration shall issue Electro-Technical Officer Certificate of Competency to the candidates who have successfully completed the Oral Examination as well as holding the respective valid Certificates of Proficiency which are required by the STCW Convention and Code."

Annex VIII

Ammendments to ANNEX (EP.1.1) of Marine Guidance (6/2021)

System of Maritime Education &Training, Examination and Certification for Rating Engine-Certificate of Proficiency

(Ratings forming part of an engine-room watch on a seagoing ship powered by main propulsion machinery of 750 kW propulsion power or more)

(STCW Regulation III/4)

1. The preface paragraph of ANNEX (EP.1.1) is replaced as follow:

   "The examination course for certification of Rating Engine (Rating forming part of an engine-room watch or designated to perform duties in a periodically unmanned engine-room on a sea going ship powered by main propulsion machinery of 750kW propulsion power or more) consists of Written and Oral examinations."

2. The table of teaching hours, examination mode & marking system for rating engine course and examination is replaced as follow:

<table>
<tr><th rowspan="2">Subjects</th><th rowspan="2">Teaching Hours</th><th colspan="3">Demonstrating competence</th></tr>
<tr><th></th><th>Hours</th><th>Pass</th></tr>
<tr><td>Watchkeeping</td><td>39</td><td rowspan="3">Written Assessment (MTC)</td><td rowspan="3">100</td><td rowspan="3">50</td></tr>
<tr><td>Boiler watch</td><td>6</td></tr>
<tr><td>Emergency equipment and applying procedure</td><td>15</td></tr>
<tr><td>Total Teaching Hours</td><td>60</td><td>Oral Assessment (MTC)</td><td></td><td>70</td></tr>
</table>

Annex IX

Ammendments to ANNEX (EP.2.1) of Marine Guidance (6/2021)

System of Maritime Education &Training, Examination and Certification for Rating Engine-Certificate of Proficiency
(Ratings forming part of an engine-room watch on a seagoing ship powered by main propulsion machinery of 750 kW propulsion power or more)
(STCW Regulation III/4)

1. The table of teaching hours, examination mode & marking system for rating engine course and examination is replaced as follow:

Subjects	Teaching Hours	Demonstrating competence		
		Method	Hours	Pass
Marine Engineering practical subjects (Workshop Skills)	180	Continuous Assessment (MTC)	-	-
Watchkeeping	39	Written Assessment (MTC)	1	50
Boiler watch	6			
Emergency equipment and applying procedure	15			
Total Teaching Hours	**240**	Oral Assessment (MTC)		70

Ammendments to ANNEX (EP.4.1) of Marine Guidance (6/2021)

System of Maritime Education & Training, Examination and Certification for Electro-Technical Rating -Certificate of Proficiency (Electro-Technical Rating on a seagoing ship powered by main propulsion machinery of 750 kW propulsion power or more) (STCW Regulation III/7)

Paragraph 2 (New MET system)

1. The whole paragraph (2) is added as follow:

"Every candidates B.E or B.Tech or MMMC (Diploma in Marine Technology) or AGTI or GTC (Diploma of Technology) in subjects other than Electrical, Electronics and Mechatronics or B.Sc (Maths or Engineering) shall:

(A) have successfully completed written examination (placement test for ETR course) conducted in approved training centres. The candidates, who have failed the placement test, shall have completed the following **Basic Electro-Technology Subjects** (12 weeks) and passed the written assessment at approved training centres. That written examination (placement test for ETR course) shall be administered, supervised and monitored by the Department of Marine Administration.

(1) Basic Electrical, Electronic and Control Engineering

(2) Basic Maintenance and Repair

(B) have successfully completed Electro-technical Rating examination course for 6 months including Workshop Skills Training conducted in approved training centres with continuous assessment system for the following Electro-Technical Engineering Knowledge subjects:

(1) Electrical, Electronic and Control Engineering

(2) Maintenance and repair

(3) Controlling the operation of the ship and care for persons onboard

(C) Have successfully completed the **written examination** for the Electro-Technical Engineering Knowledge subject conducted by the relevant training centre.

That written examination shall be administered, supervised and monitored by the Department of Marine Administration."

Paragraph 3 (New MET system)

2. The whole paragraph (3) is added as follow:

"Every candidates who have passed BEHS or matriculated with science subjects or THS other than (electrical, electronic) or GCE "O" level or equivalent certificate approved by Ministry of Education:

(A) shall have completed the following **Basic Electro-Technology** subjects (12 weeks) and passed the written assessment at approved training centres. That written examination (placement test for ETR course) shall be administered, supervised and monitored by the Department of Marine Administration.

(1) Basic Electrical, Electronic and Control Engineering

(2) Basic Maintenance and Repair

(B) successfully completed Electro-technical Rating examination course for 6 months including Workshop Skills Training conducted in approved training centres with continuous assessment system for the following Electro-Technical Engineering Knowledge subjects:

(1) Electrical, Electronic and Control Engineering
(2) Maintenance and repair
(3) Controlling the operation of the ship and care for persons onboard

(C) have successfully completed the **written examination** for the Electro-Technical Engineering Knowledge subject conducted by the relevant training centre.

That written examination shall be administered, supervised and monitored by the Department of Marine Administration."

Paragraph 8 (New MET system)

3. The whole paragraph (8) is added as follow:

"The Department of Marine Administration shall issue Electro-technical Rating certificate to the candidates holding B.E (MESE) and Diploma in Marine Electrotechnology who have successfully completed the Examination for Electro-technology Practical and Supporting Knowledge Subjects and have approved sea going service of not less than 3 months in engine department on a sea going ship powered by main propulsion machinery of 750kW propulsion power or more."

Paragraph 9 (New MET system)

4. The whole paragraph (9) is added as follow:

"The Department of Marine Administration shall issue Electro-technical Rating certificate to the candidates holding B.E (Electrical or Electronics or Mechatronics) degree who have successfully completed Electro-technology Practical and Supporting Knowledge Subjects and have approved sea going service of not less than 6 months in engine department on a sea going ship powered by main propulsion machinery of 750kW propulsion power or more."

Ammendments to ANNEX (EP.4.2) of Marine Guidance (6/2021)

SYLLABUS FOR EXAMINATION OF
ELECTRO-TECHNICAL RATING – CERTIFICATE OF PROFICIENCY
(ELECTRO-TECHNICAL RATINGON A SEAGOING SHIP POWERED BY
MAIN PROPULSION MACHINERY OF 750 KWPROPULSION POWER OR MORE)
(STCW Regulation III/7)

1. The syllabus for the Basic Electro-Technology Subjects Course is added as follow:

1.1 "SAFE USE OF ELECTRICAL EQUIPMENT

.1 Safe use and Operation of Electrical Equipment, including Safety precautions before commencing work or repair:

.1 Understanding ship electrical system.

.2 Understanding of maintenance procedures.

.3 General knowledge about electrical, electronic equipment and other related machineries.

.4 Knowledge about ship electric circuit diagram.

.5 Location of equipment and panels, protective things, tools, measuring instruments (volt meter, multimeter, clamp on meter, insulation meter).

.6 Isolation procedure, checked breaker on/off and lock, isolate fuses and keep in safe place, put warning signboard on the switchboard.

.7 Emergency Operation of Equipment and Procedures (Emergency Switchboard, Emergency Generator, etc,,,)

.8 General Knowledge about different voltages depends on demand of load and equipment for safe use of equipment and measuring tools

.9 Causes of electric shocks

.10 Knowledge and precaution to prevent shock

.2 Basic Knowledge of Electro-technology and Electrical Machines Theory:

.1 Simple circuits and Ohm's Law

.2 Application of Ohm's and Kirchhoff's law and Basic

.3 Batteries

.4 DC Generators

.5 D.C Motors

.6 Series and Parallel Circuits

.7 Alternating Current

.8 A.C. Motors

.9 Impedance and Inductance

.10 Fundamentals of Generators and Motors

.11 Work, Energy and Power

.12 Electrical Power Supply

.13 Conductors

.14 Insulation

.15 Distribution

.16 Alternators

.17 Lighting

.18 Electron Theory

.19 to Magnetic circuits
.20 Introduction of an iron core
.21 Natural and artificial magnets
.22 molecular theory of magnetism
.23 Flux-Linkages
.24 Faraday's and Lenz's laws
.25 Fleming's right-hand rule.
.26 Circuit Theories
.27 Introduction to Transformer
.28 Transformer working principle, losses, EMF equation and types
.29 Efficiency and Regulation, 3_Ph Transformer, Auto -transformer
.30 Wires and Cable
.31 Switch Fuse Unit
.32 MCB and MCCB
.33 Voltage controlled ELCB
.34 ELCB (current Operated) RCCB

.3 Use hand tools, electrical and electronic measurement equipment for fault findings, maintenance and repair operations;

1. Safety requirements for working on shipboard electrical systems
2. Basic knowledge of Construction and operational characteristics of shipboard AC and DC systems and equipment

.3 Marking out
.4 Hand tools
.5 Power hand tools
.6 Measurement tools
.7 Drilling machines & Grinding machines
.8 Adhesives and Bonding"

Annex XII

Ammendments to Definitions and Abbreviations of Marine Guidance (6/2021)

Paragraph 23

1. The paragraph (23) "Definitions and Abbreviations of High Voltage" is added as follow:

"High Voltage" means an alternating current (AC) or direct current (DC) voltage in excess of 1000 volts."

Remark: Paragraph number of Definitions and Abbreviations of Marine Guidance (6/2021) is increased from 44 to 45.