Part A
Course Framework

■ Scope

This **Marine Steam Turbine (MST)** course covers the mandatory competence and the required knowledge, understanding and proficiencies prescribed in Section A-III/2, Table A-III/2 of the STCW Code as amended, specifically on **marine steam turbine** including its machineries and associated auxiliaries.

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

■ Training Outcome

To meet the minimum standard of competences for all trainees assigned to shipboard duties on liquefied natural gas tankers propelled by steam turbine as required in Section A-III/2 of the STCW Code, this course is designed to enable the trainees to successfully demonstrate the competences on *Marine Steam Turbine:*

Specifically, at the end of the course the trainee must:

- manage the operation of propulsion plant machinery;
- plan and schedule operation; and
- manage the operation, surveillance, performance assessment and maintaining safety of propulsion plant and auxiliary machinery;

■ Entry Standard

Entry to this course is open to all engine officers' holder of Certificate of Competency (COC) at the Operational Level with at least three (3) months seagoing service in that capacity.

■ Course Certificate

On successful compliance of the requirements of the course, a Certificate of Training Completion shall be issued as evidenced of fulfilling the mandatory minimum requirements and competences specifically on **marine steam turbine** including its machineries and associated auxiliaries as required in Regulation III/2 of the STCW Convention, 1978, as amended.

■ Course Intake Limitations

The number of trainees shall not exceed twelve (12) per class.

■ Staff Requirements

The course must have an Instructor, an Assessor and a Supervisor accredited by the Administration with the following qualifications:

Instructor

- holder of Certificate of Competency (COC) as Management Level Engine Officer;
- holder of a Certificate of Proficiency (COP) in Basic and Advanced Training for Liquefied Gas Tanker Cargo Operations;
- with at least one (1) year seagoing service in the Operational Level (or higher) on a liquefied gas tanker propelled by marine steam turbine;
- holder of Certificate of Training Completion in the Training Course for Instructors (IMO Model Course 6.09); and
- holder of Certificate of Training Completion in the Training Course of Train the Simulator Trainer and Assessor (IMO Model Course 6.10).

Assessor: The assigned assessor must possess the same qualifications of the instructor and in addition, must have a Certificate of Training Completion in the Training Course on Assessment, Examination and Certification of Seafarers (IMO Model Course 3.12).

■ Assessment

In determining the achievement of required competences in Column 1 of Table A-III/2, the assigned assessor shall be guided by the criteria for evaluating competence in Column 4, the Intended Learning Outcomes stipulated in the Course Syllabus and the assessment tasks enumerated in the Assessment Plan.

■ Teaching Facilities and Equipment

For theoretical and practical parts of the course, lectures and demonstrations shall be held in a classroom of with set of functional audio visual equipment. Classroom of 42 square meters with no side shall be less than 5 meters

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

Item	Quantity
Simulator or computer sets with programs capable of: • operating the marine steam turbine propulsion plant • performing plant up and plant down of main propulsion and auxiliary machinery • operating limits of marine steam turbine propulsion plant • conducting surveillance, performance assessment and maintaining safety of marine steam turbine propulsion • troubleshooting common faults or alarms *Note:* Workstation to trainee ratio: - 1:4 (Simulator) - 1:2 (Computer set)	6 + 1 (6 workstations and 1 instructor's station) *The minimum number of workstation shall not be less than 4 units.* *The intake limitations maybe adjusted accordingly following the prescribed workstation to trainee ratio.*
Briefing/debriefing room	1 room

Note: All equipment must be labeled with MTI's name

■ Teaching Aid (A)

A1 Visual Presentations

A2 Training videos related to the following:

- Introduction to Marine Steam Turbine
- Working principle of impulse and reaction steam turbine
- How marine steam turbine works?
- The Rankine cycle
- Working principle of marine boiler

A3 Graph:

- Sea water temperature vs main condenser vacuum graph
- Performance Curve Graph

A4 Diagrams:

- Heat Balance Diagram
- Control Mechanism of marine steam turbine
- Piping system for warm up of marine steam turbine plant
- Piping diagram related to the operation of marine steam turbine plant (such as: boiler feed water, condensate water, high pressure steam, reduced pressure steam, exhaust and dump steam, low pressure steam, clean drain, lubricating oil, cooling fresh water, sea water circulating, cooling sea water)

A5 Checklist (Simulator familiarization)

A6 Manufacturer's instruction manual for marine steam turbine

A7 Exercise Sheet

Note: Other titles of video materials may be used provided it has similar content.

■ IMO Reference (R)

R1 International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended, 2017 Edition

R2 ISM Code, International Safety Management Code, 2018 Edition

Note: MTIs may use additional references as deemed necessary to meet the intended learning outcomes of this training course

Bibliography (B)

The MTI's may choose from the following bibliography or they may use other references provided it has similar contents.

B1 Introduction to practical marine engineering, Alan L. Rowen, Raymond F. Gardner, Jose Femenia, David S. Chapman, Edwin G. Wiggi

B2 Introduction to marine engineering 2nd edition, D.A Taylor

B3 Marine Steam Engines and turbines 3rd edition, W.J Fox & S.C McBirnie

B4 Engineering thermodynamics work and heat transfer (S.I UNITS), G.F.C. Rogers & Y.R Mayhew

B5 Manufacture's instruction manual for marine steam turbine, A Shipyard

Note: The MTIs shall provide at least two (2) bibliography of the latest edition for this course. Electronic publications may be accepted as alternatives to printed copies of latest edition and must be sourced from authorized publishers.