

SHIP ENERGY EFFICIENCY



TARGET GROUP

Ship Energy Efficiency training course is intended for ship navigators and ship engineers, management and operators involved into daily operation of vessels.



OBJECTIVES OF THE COURSE

In this course is that the participants should gain basic knowledge of IMO regulatory framework for ship energy efficiency, Chapter 4 of MARPOL Annex VI regulations, Guidelines for calculation of Attained EEDI, Guidelines for verification of Attained EEDI, Guidelines for development of SEEMP, Guidelines for calculation of EEOI.

Course meets the objectives listed in Ship Energy Efficiency Regulations and Related Guidelines



COURSE CONTENTS

The Ship Energy Efficiency training course covers the following topics:

- IMO regulatory framework for ship energy efficiency;
- Chapter 4 of MARPOL Annex VI regulations;
- Guidelines for calculation of Attained EEDI;
- Guidelines for verification of Attained EEDI;
- Guidelines for development of SEEMP;
- Guidelines for calculation of EEOI;
- Test;
- Practical examination.



THE COURSE PROGRAM

DAY 1

- Course introduction and objectives
- IMO regulatory framework for ship energy efficiency
 - IMO energy efficiency regulatory activities
 - IMO framework for GHG emissions control from ships
 - EEDI, EEOI and SEEMP links
 - EEDI, EEOI and SEEMP processes
- **PART 1** – MARPOL Annex VI Regulations on Energy Efficiency for Ships
 - Amendments to Existing Annex VI Regulations
 - Res.MEPC.203(62) vs Res.MEPC.176(58)
 - New ship (Reg. 2.23)
 - Major conversion (Reg. 2.24)
 - Ship types definitions (part of Regulation 2)
 - Surveys and certification (Reg. 5.4)
 - IEE (International Energy Efficiency) Certificate (Reg. 6)
 - International Energy Efficiency Certificate
 - Duration of validity of IEEC (Reg. 9)
 - Port State Control on operational requirements (Reg. 10)
 - New Chapter 4 of MARPOL Annex VI Regulations
 - Res.MEPC.203(62) vs Res.MEPC.176(58)
 - Regulation 19 - Application
 - Regulation 19 – Application (Waiver)
 - Regulation 20 – Attained EEDI
 - Regulation 21 – Required EEDI
 - Regulation 21.1 – Required EEDI
 - Regulation 21 – Required EEDI (Continue)
 - Regulation 21 – Required EEDI details Cut-off levels, phases and reduction rates
 - Reference lines
 - Regulation 21.3 – Reference line
 - Reg. 21 - Reduction factor and cut-off limits
 - Review of phases and reduction factors (Reg. 21.6
 - Technology review for EEDI Phase 2
 - Regulation 22 – SEEMP
 - SEEMP and IEE Certificate
 - Verification that a SEEMP is on-board
 - Regulation 23 - Promotion of technical cooperation and technology transfer
 - Supplement to IEEC – Record of construction

- **PART 2** – Guidelines on EEDI Calculation and Verification
 - Guidelines on the Calculation of the Attained EEDI
 - Attained EEDI: Formula
 - Attained EEDI: Calculation formula
 - Scope of Attained EEDI (dashed red line)
 - Attained EEDI: Parameters
 - EEDI condition
 - Main Parameters
 - Capacity
 - Main (engine) power – PME (options)
 - Main engine power (options)
 - Reference speed – Vref
 - Auxiliary (engine) power – PAE
 - Engine Specific Fuel Consumption – SFC

DAY 2

- Factors and Correction Factors
 - Factors in EEDI formula
 - CF (carbon factor) [Clause 2.1]
 - Availability factor $f_{eff}(i)$
 - Correction factors
 - f_j design correction factor for propulsion power
 - f_i correction factor for ship capacity for technical/regulatory limitations (1)
 - f_i correction factor for ship capacity for technical/regulatory limitations (2)
 - f_c : Cubic Capacity correction factor
 - Summary on Attained EEDI calculations
- Guidelines on Survey and Verification of EEDI
 - Verification stages
 - Verification process (Clause 4.1)
- Preliminary Verification
 - Tank test aspects
 - Additional information
- Final Verification
 - Sea trials
 - Parameters to be checked
 - Speed trial – Power curve
 - Verification of the attained EEDI for major conversions
- Other EEDI Relevant Guidelines
 - Guidelines on Ship Minimum Power
 - Minimum power: Assessment method
 - Guidelines on Innovative EE Technologies
 - The technologies covered so far
 - Categories of Innovative EE Technologies
 - Summary on EEDI verification

- **PART 3** – Guidelines on SEEMP and EEOI
 - Guidelines for Development of SEEMP
 - Introduction
 - SEEMP for ship OR company?
 - SEEMP Framework and Main Elements
 - SEEMP framework
 - Planning
 - Planning – Importance
 - Planning – Identification of ship-specific “energy efficiency measures”
 - Planning – Company energy management plan
 - Human resources development
 - Planning - Goal setting
 - Implementation
 - Implementation – Establishment of implementation systems
 - Implementation – Record keeping
 - Monitoring and Evaluation
 - Monitoring tools
 - Self-evaluation and improvements
 - SEEMP format
 - Summary on SEEMP Guidelines
 - Guidelines for Calculation of the EEOI
 - EEOI Guidelines: IMO Circular MEPC.1/Circ.684
 - EEOI Guidelines: Some extracts from Circ.684
 - EEOI Formula
 - Definitions (1)
 - Definitions (2) Cargo mass carried (m_{cargo})
 - Establishing the EEOI
 - EEOI Calculation
 - Calculation of the EEOI – Formula
 - Calculation of the EEOI – Rolling average
 - Calculation of the EEOI – Data sources
 - Calculation of the EEOI – Data sheet template
 - Calculation of the EEOI (example)
 - EEOI calculations and variability

Note: during the training course, theoretical classes are given using PowerPoint presentations, practical tasks are conducted using Novikontas Maritime College digital education platform.