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THE CAPACITY-BUILDING DECADE 2021-2030 STRATEGY

Information on the delivery of a Train-the-Trainer programme at the World Maritime University (WMU) and the Maritime Technology Cooperation Centre (MTCC) Asia, designed to equip maritime professionals with the capacity to develop and deliver training in support of the decarbonization of the maritime industry

Submitted by the World Maritime University

SUMMARY

Executive summary: This document provides information on the delivery of a Train-the-Trainer programme at the World Maritime University (WMU) and, subsequently, at the IMO Maritime Technology Cooperation Centre (MTCC) Asia. The programme was designed to equip maritime professionals with the skills and knowledge needed to develop and deliver training in support of the decarbonization of the maritime industry. The focus was on three fuels, i.e. ammonia, methanol and hydrogen. This Train-the-Trainer programme was delivered by WMU as part of the Maritime Just Transition Task Force project on the Baseline Training Framework for Seafarers in Decarbonization.

Strategic direction, if applicable: 1, 2, 3, 6, and OW

Output: 1.7, 1.32, 2.3, 3.2, 3.4, 3.7, 3.8, 6.1 and OW 1

Action to be taken: Paragraph 13

Related documents: TC 73/15; TC 75/6/2; HTW 11/7/2 and resolution MEPC.377(80)

Background

1 The maritime sector is witnessing a substantial shift towards the adoption of cleaner and more sustainable fuels. The transition to alternative fuels such as ammonia, methanol and hydrogen is crucial for mitigating greenhouse gas emissions in the maritime industry and ships using ammonia, methanol and hydrogen as marine fuels are increasingly available. For example, the first ammonia-ready vessel was launched in early 2022. As of March 2025, 28 ammonia-ready vessels are operational, while 130 ammonia-fuelled vessels and 225 ammonia-ready vessels have been ordered and announced.¹ As of May 2024,

¹ Ammonia Energy Association. (2025). Ammonia Fuelled Vessels. <https://ammoniaenergy.org/lead/vessels/>

there were 62 ships capable of using methanol and some 160 methanol-fuelled ships on order.² Hydrogen has been successfully tested as fuel for ocean-going vessels,³ and so far it has been reported that orders have been delivered or placed for ferries, tugs, crew transfer vessels, workboats and dredgers, using either fuel cells or internal combustion engines.⁴

2 The availability of new ships capable of using alternative fuels is increasing; as such, seafarers need to be well prepared to contribute to the safe operation of these ships. This training gap was recognized as an urgent need by IMO Member States during HTW 10 and a separate Working Group on Development of Training Provisions for Seafarers on Ships Using Alternative Fuels and New Technologies was established at HTW 11. This challenge was also addressed at TC 73 and the Maritime Just Transition Task Force (MJTTF) launched a project to develop a Baseline Training Framework for Seafarers in Decarbonization in support of resolution MEPC.377(80) on *2023 IMO Strategy for the Reduction of GHG Emissions from Ships*.

3 The project outputs, including the interim training framework for seafarers with knowledge, understanding and proficiencies (KUPs) to be considered towards training for working on alternatively-fuelled ships (HTW 11/7/2), contributed to the discussion during HTW 11. A draft training framework was tested through the Train-the-Trainer programme which aims to provide trainers with the essential knowledge and pedagogical skills necessary to effectively train seafarers on alternative fuels, including ammonia, methanol and hydrogen.

4 A roll-out of the Train-the-Trainer programme was held at the World Maritime University (WMU) in December 2024, and was further tested in Asia through a programme led by WMU and supported by the IMO Maritime Technology Cooperation Centre (MTCC) Asia in April 2025. A detailed report on the implementation of the two training sessions can be found in paragraphs 5 to 11.

Roll-out of the Train-the-Trainer programme at the World Maritime University

5 From 17 to 18 December 2024, a roll-out of the Train-the-Trainer programme was held at WMU's headquarters in Malmö, Sweden. A total of 26 WMU MSc students who are maritime professionals specializing in Maritime Education and Training (MET) and Maritime Energy Management (MEM) participated in this roll-out. Participants represented 18 different countries and 31% (n=8) were women. WMU also welcomed two observers, Ms. Alishba Zaman from the United Nations Global Compact and Mr. Matt Dunlop from the Fonden Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping.⁵

6 The programme covered an introduction to alternative fuels, focusing on their properties, environmental impacts, and training methodologies tailored to seafarers and shore-based personnel. An in-depth exploration followed regarding safety protocols, emergency responses, and advanced bunkering procedures related to ammonia, methanol and hydrogen. According to the results of pre- and post-course surveys among the participants (the response rate was 100%), the Train-the-Trainer programme resulted in positive outcomes in terms of their acquired knowledge and skills (figure 1).

² DNV. (2024). Maritime Forecast to 2050, p.6

³ MITSUI E&S (2024). World's First Successful Hydrogen Combustion Operation with a Large Marine Engine. Press Release. 7 May 2024.

⁴ DNV. (2025). Safe Introduction of Alternative Fuels: Focus on ammonia and hydrogen as ship fuels. White Paper, p.12.

⁵ See more information at: <https://www.wmu.se/news/wmu-pioneering-training-alternative-fuels>

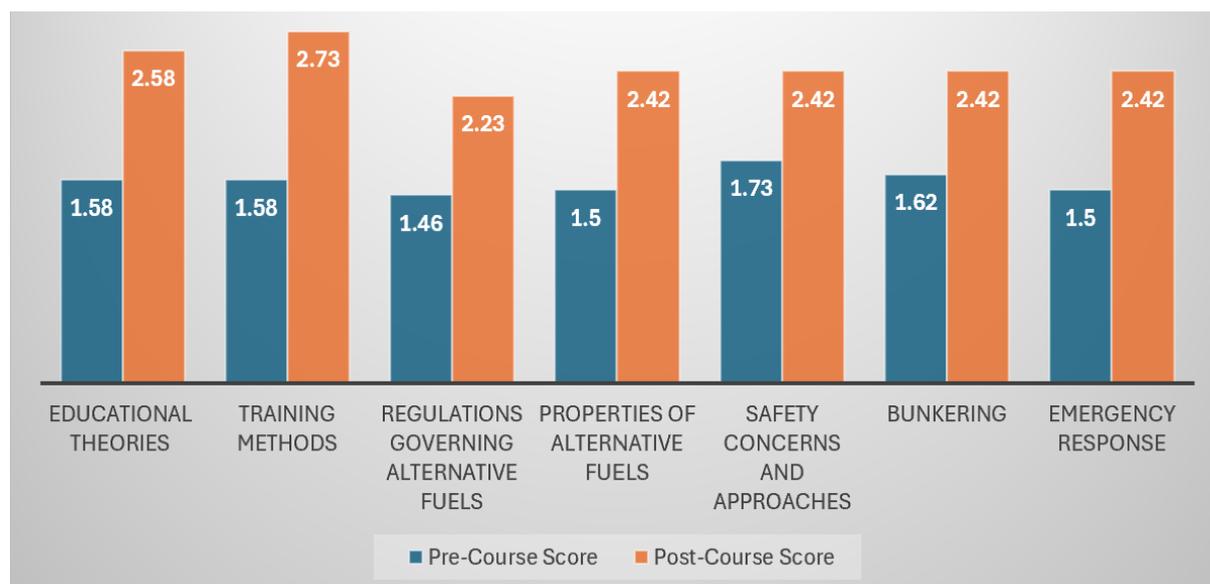


Figure 1 – A comparison of WMU participants' self-evaluation of their knowledge levels on selected topics from pre- and post-course surveys⁶

A large-scale roll-out of the Train-the-Trainer programme at the MTCC Asia

7 From 14 to 18 April 2025, a large-scale roll-out of the Train-the-Trainer programme was held at MTCC Asia's headquarters in Shanghai, China, at the campus of Shanghai Maritime University (SMU). Among the 34 training participants, there were 15 IMO-funded participants from Bangladesh; India; Indonesia; Malaysia; Pakistan; Philippines; Thailand; and Viet Nam; 14 self-funded participants from China; Hong Kong, China; Japan; Republic of Korea; and Singapore; 1 from MTCC Asia; and 4 intergovernmental organization (IGO) representatives nominated by the partners of MJTTF, including the United Nations Global Compact (UNGC), International Chamber of Shipping (ICS), International Transport Workers' Federation (ITF), with observers from Lloyd's Register.

8 Approximately 44% of the participants (n=15) were funded by IMO. Following IMO's efforts to support gender equality and the empowerment of women, in particular through facilitating access to high-level technical training for women in the maritime sector, 41% of the participants were female (n=14). Four of the WMU instructors were male and three were female.

9 The training programme was enhanced from the previous roll-out at WMU by incorporating feedback collected through the post-course evaluation survey from the participants. Updates included additional practical sessions, using scenario-based learning derived from real-world cases, and providing demonstrations of safety equipment and procedures. Additionally, the training incorporated a visit by experienced seafarers and port operators at Shanghai Port regarding methanol bunkering facilities. Feedback from the Action Group of the MJTTF project was also incorporated into the training structure, focusing on one fuel type per day. This allowed participants to avoid confusion and process a manageable amount of information about each alternative fuel. Participants were divided into six groups of six, with mixed backgrounds, nationalities, gender and age, and engaged in collaborative learning activities, such as discussions, case studies and presentations.

⁶ The scores for knowledge improvement are based on a 3-point qualitative scale: Very Limited: Score = 1 (Indicates minimal or no knowledge on the topic); I Know a Little: Score = 2 (Indicates basic or introductory knowledge); and I Know a Lot: Score = 3 (Indicates substantial or advanced knowledge).

10 Similar pre- and post-course surveys were conducted among the participants of the Train-the-Trainer programme in MTCC Asia. The response rate was 94%. The results show positive outcomes, in particular on safety concerns and approaches, properties of alternative fuels, teaching methods, assessment methodologies and emergency response (figure 2). All these high-scored elements were the result of collaborative group activities and demonstrated their newly acquired knowledge and skills in training development, delivery and assessment.

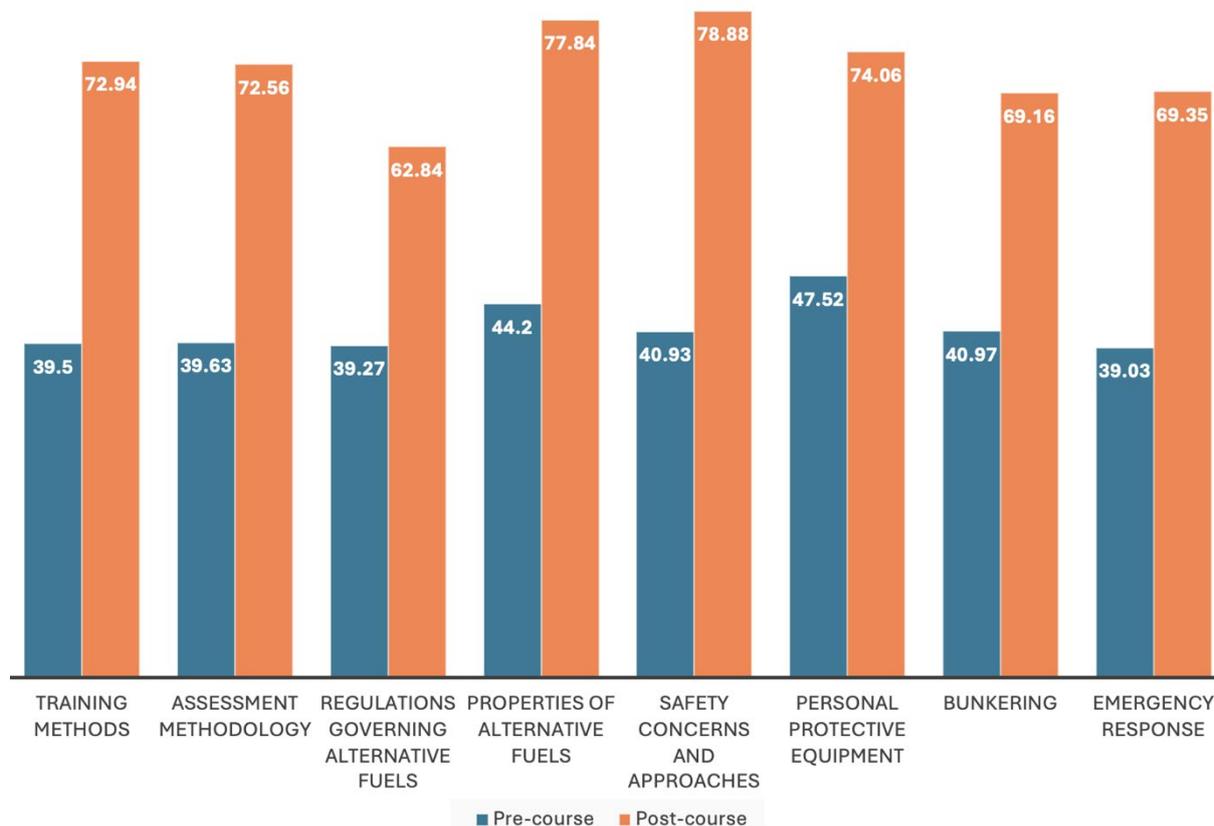


Figure 2 – A comparison of MTCC Asia participants' self-evaluation of their knowledge levels on selected topics from pre- and post-course surveys⁷

11 On the last day, participants were given an opportunity for a group discussion on the next priority to ensure seafarer training is ready for operating ships using alternative fuels. They agreed that the development of training standards would be one while preparing qualified instructors, training facilities and equipment the other, which confirms the demand of the outcomes from the MJTTF project to develop the baseline training framework for seafarers in decarbonization and the delivery of Train-the-Trainer. In addition, this programme increased awareness of necessary cooperation among maritime administrations, training institutions and the industry, including shipping companies, manufacturers, shipyards, classification societies and seafarers. Participants also felt that their Train-the-Trainer network could serve as a global working group for connecting maritime stakeholders and leading collaboration for common goals.

12 Partnerships with IMO, MTCC Asia and MJTTF showcased the successful implementation of the Train-the-Trainer programme to respond to the urgent need to provide training for seafarers and shore-based personnel to prepare for the safe operation of ships

⁷ The survey was conducted through QuestionPro as an alternative software to Google Forms for the participants while in China. The scores for knowledge improvement are based on a 100-point scale in figure 2.

using ammonia, methanol and hydrogen as marine fuels. In the process of implementation, several United Nations Sustainable Development Goals (SDGs) were addressed, including SDGs 4 (quality education), 5 (gender equality), 7 (clean energy), 8 (decent work), 9 (industry, innovation and infrastructure), 13 (climate action), 14 (life below water) and 17 (partnerships). WMU, as IMO's premier centre of excellence for maritime postgraduate education, research and capacity development, will continue to support the mission of the Organization and contribute to sustainable shipping with a unique combination of technical and educational expertise and experience.

Action requested of the Committee

13 The Committee is invited to note the information provided.
