Supporting the Safe Transition of Seafarers and Personnel in Maritime Decarbonisation

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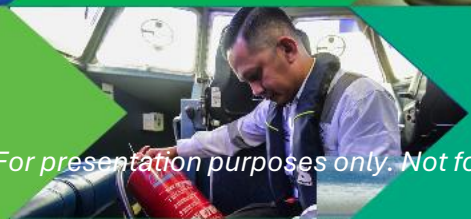


A brief introduction…

- Overseeing key functions within MPA's Shipping Division –
  - Singapore Registry of Ships
  - Seafarers Policy, Development and Welfare
  - Seafarers Skills, Upgrading, Certification and Accreditation
  - Ship Regulations, Designs and Standards

- Previously Singapore's liaison officer to the International Maritime Organization (IMO) from 2021 to 2024

Ongoing work by the IMO on Reduction of Greenhouse Gas (GHG) Emissions from Ships

Developments at the IMO in recent years

Marine Environment Protection Committee (MEPC)

In 2023, MEPC 80 adopted a revised IMO GHG strategy

- Achieve net-zero GHG emissions by or around, i.e. close to 2025

In 2025, MEPC 83 approved IMO Net Zero Framework, expected adoption in Oct 2025

- Global fuel standard + GHG pricing mechanism through trading of compensation units
- Incentivises use of zero- or near-zero-emission fuels and technologies

Maritime Safety Committee (MSC)

In 2024, MSC 108 commenced development of safety regulatory framework for reduction of GHG emissions from ships using alternative fuels

- **Carriage of Cargoes and Containers (CCC) Sub-Committee intensified work on developing safety provisions for new and alternative fuel types –**
  - Developed guidelines – methyl/ethyl alcohols (2020), fuel cells (2022), ammonia (2024)
  - WIP guidelines – hydrogen (2025/2026), low flashpoint fuels (2026)
- **Human Element, Training and Watchkeeping (HTW) Sub-Committee commenced development of training provisions for seafarers in 2025**

Addressing training requirements for the use of alternative fuels and new technologies

- International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW Convention) sets out qualification standards for seafarers

- Various amendments since its entry into force in 1984, including:
  - 2015 amendments establishing training provisions for personnel on ships subject to the International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code)

- **However, existing STCW Convention does not fully address unique training requirements associated with alternative fuels and new technologies**

Unique safety hazards

- Fuels like methanol, ammonia and hydrogen are **toxic**, **flammable** or highly **pressurized**
- Cryogenic fuels such as liquid hydrogen present **frostbite** and **explosion risks**

Lack of standardised training

- No **existing uniform global standard** for training on ships using alternative fuels
- Upcoming **planned newbuild deliveries** capable of using alternative fuels such as methanol and ammonia
- Potential **inconsistencies and safety risks** across international operations / stakeholders

Pace of technological change

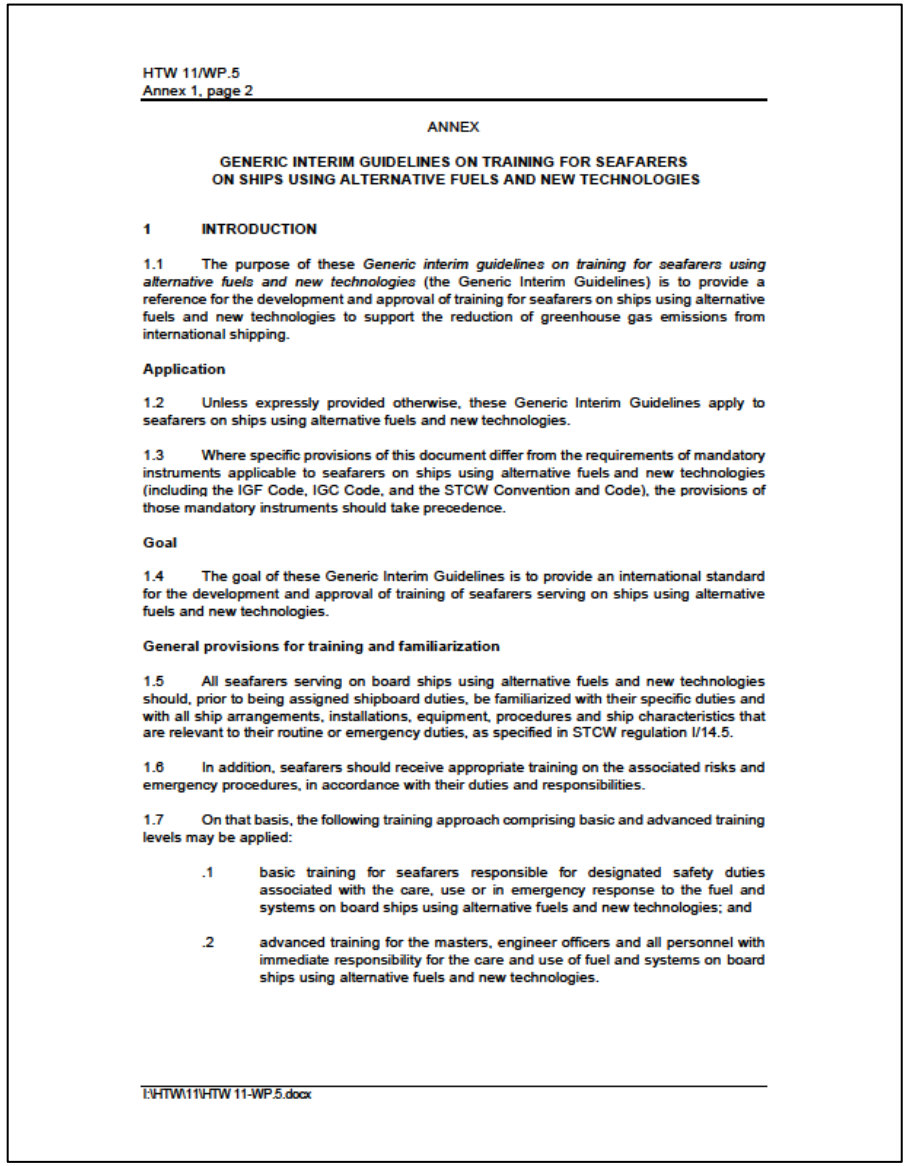
- **Advancements in ship propulsion technologies** – fuel cell, hybrid, battery / electric systems
- **Existing competencies inadequate** to cover new systems – fuel design and control, emission reduction technologies, digital monitoring

HTW 11 embarked on the development of training provisions for seafarers on ships using alternative fuels and new technologies

- HTW 11 (Feb 2025) established a new working group under the coordination of Singapore, to develop various training provisions
- Key outcomes:
  - **Finalised generic interim guidelines** – applicable industry-wide and relevant to all alternative fuels and new technologies (adopted by MSC 110 in Jun 2025)
  - **Commenced development of specific interim guidelines** – fuel / technology-specific arrangements and emergency procedures, to be aligned with safety provisions developed by IMO

(A) Generic interim guidelines

- **Approved by MSC 110 in Jun 2025 for issuance as STCW Circular**
- General provisions for training and familiarisation – on duties, responsibilities and emergency procedures
- Training approach comprises **two levels**:
  - **Basic training** – for seafarers with designated safety duties associated with care, use or in emergency response to the fuel and systems (Support level)
  - **Advanced training** – for masters, engineer officers, and personnel immediately responsible for care and use of fuel and systems (Operational / management level)
- Does not contain specific Competencies or Knowledge, Understanding and Proficiency (KUP)
- May be regarded as an **overarching framework for developing specific interim guidelines** for other alternative fuels and technologies



HTW 11/WP.5
Annex 1, page 2

ANNEX

GENERIC INTERIM GUIDELINES ON TRAINING FOR SEAFARERS ON SHIPS USING ALTERNATIVE FUELS AND NEW TECHNOLOGIES

1 INTRODUCTION

1.1 The purpose of these *Generic interim guidelines on training for seafarers using alternative fuels and new technologies* (the Generic Interim Guidelines) is to provide a reference for the development and approval of training for seafarers on ships using alternative fuels and new technologies to support the reduction of greenhouse gas emissions from international shipping.

Application

1.2 Unless expressly provided otherwise, these Generic Interim Guidelines apply to seafarers on ships using alternative fuels and new technologies.

1.3 Where specific provisions of this document differ from the requirements of mandatory instruments applicable to seafarers on ships using alternative fuels and new technologies (including the IGF Code, IGC Code, and the STCW Convention and Code), the provisions of those mandatory instruments should take precedence.

Goal

1.4 The goal of these Generic Interim Guidelines is to provide an international standard for the development and approval of training of seafarers serving on ships using alternative fuels and new technologies.

General provisions for training and familiarization

1.5 All seafarers serving on board ships using alternative fuels and new technologies should, prior to being assigned shipboard duties, be familiarized with their specific duties and with all ship arrangements, installations, equipment, procedures and ship characteristics that are relevant to their routine or emergency duties, as specified in STCW regulation I/14.5.

1.6 In addition, seafarers should receive appropriate training on the associated risks and emergency procedures, in accordance with their duties and responsibilities.

1.7 On that basis, the following training approach comprising basic and advanced training levels may be applied:

.1 basic training for seafarers responsible for designated safety duties associated with the care, use or in emergency response to the fuel and systems on board ships using alternative fuels and new technologies; and

.2 advanced training for the masters, engineer officers and all personnel with immediate responsibility for the care and use of fuel and systems on board ships using alternative fuels and new technologies.

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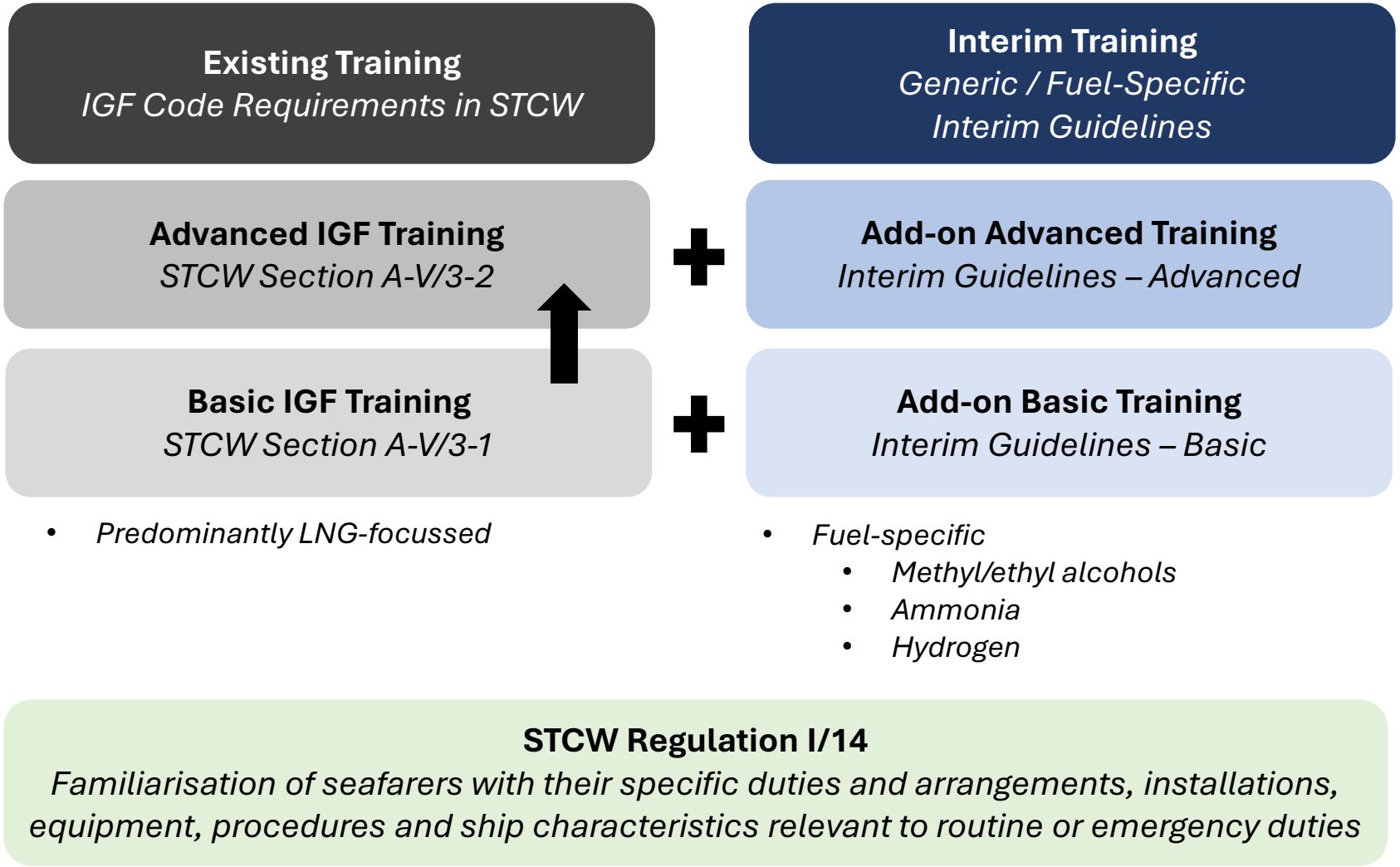
(B) Fuel / technology-specific interim guidelines

- HTW 11 agreed to develop **specific interim guidelines** as per below order:
  - **Methyl / ethyl alcohols**
  - **Ammonia**
  - **Hydrogen fuel cell**
  - **Liquefied petroleum gas (LPG)**
  - **Hydrogen**
  - **Battery-powered ships**

- Specific interim guidelines for fuels references **IGF Code training as the baseline**, supplemented with **additional competencies and KUPs for addressing gaps**
- Establishes a **relationship with IMO-developed safety guidelines**
- Concerns over **over-training**; **mobility of seafarers across ship types**; possible need to **decouple IGF Code training from its LNG focus**
- HTW 11 initiated development of interim guidelines for methyl/ethyl alcohols; work continuing under an intersessional Correspondence Group

Envisaged training arrangements for alternative fuels in the near to medium term



Note: Alternative training arrangements may be applied for new technologies (battery power), to the satisfaction of respective Administrations

MPA’s efforts in supporting an equitable transition for seafarers and maritime personnel

Singapore has gained significant experiences through various trials on alternative fuels bunkering and operations

<u>July 2023</u>
World's first ship-to-containership methanol bunkering involving dual-fuelled *LAURA MAERSK*

<u>May 2024</u>
World's first simultaneous methanol bunkering and cargo operations involving *ECO MAESTRO*

<u>Mar – May 2024</u>
World's first use of ammonia as a marine fuel on dual-fuelled ammonia-powered *GREEN PIONEER*

MPA has worked with key maritime training institutes to develop training courses for handling of alternative fuels

Course title:	Basic and Advanced Training for Handling of Methanol as Fuel for Maritime Personnel
Mode of training:	Theory lectures and hands-on practical firefighting
Training Provider:	Singapore Maritime Academy (SMA)
Duration of training:	Basic theory (1 day in-person or 18 hrs online) + 0.5 day hands-on practical firefighting Advanced theory (1.5 days in-person or 25 hours online) + 0.5 day hands-on practical firefighting

Course Outline

1. Laying the foundations: Methanol as Fuel

- **Safety**: Learn about handling methanol safely to prevent accidents
- **Properties**: Methanol is flammable and needs careful handling
- **Health Risks and hazards**: Methanol exposure risks

2. Safety Measures and emergency response

- **Protection and training**: Proper use of protective equipment
- **Training**: Prevention measures and emergency response

3. Other Advanced Training Content

- Fuel systems
- Environmental impact

Source: CNA, 13 Aug 2024 (https://www.channelnewsasia.com/watch/over-200-workers-around-world-took-methanol-ship-safety-course-march-4543556?**)**

MPA also launched the Maritime Energy Training Facility (METF) to support the training of seafarers and maritime professionals

A strong network of 52 local and international partners to co-develop training facilities, curriculum and courses

- **One-stop digital platform** enabling access to training and streamlining of certification issuance
- **New marine engine simulator** for alternate fuels and technologies (e.g. methanol, ammonia)
- **Integrated engine / bridge simulator** for crew management
- **Common facilities** for fire safety training, chamber for gas simulant training
- **Online and classroom-based training,** including usage of AR / VR and AI
- **Baseline courses** related to clean fuel accredited by MPA
- **Value-added courses** related to vessels operating new fuel types

Next steps

Key areas for consideration to guide future work

- Urgency for IMO to develop **specific interim guidelines**, with a view for translation into mandatory requirements
  - Potential framework for new technologies which may not utilise IGF Code as a baseline
  - Relevancy of the existing IGF Code requirements; potential amendments to incorporate fuel-specific elements (e.g. new chapters / sections)
  - Harmonisation of training approaches internationally, possibly under STCW framework

- Need for training **requirements to address the wider group of maritime personnel** beyond seafarers –
  - Bunkering personnel
  - Surveyors and inspectors
  - Pilots

- Facilitating a **just and equitable transition** globally, through partnerships and capacity development
  - Technical cooperation to facilitate knowledge sharing – through training networks, train-the-trainer programmes, promoting best practices
  - Role of maritime administrations, training institutions, IMO, industry / non-governmental organisations

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Thank you!

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