



Marine Notice 11/2015
Supersedes 13/2012

Measures to Reduce Greenhouse Gas Emissions from International Shipping

The purpose of this Marine Notice is to provide information to ship owners and operators on technical and operational measures to reduce greenhouse gas (GHG) emissions from ships.

Amendments to Annex VI of the International Convention for the Prevention of Pollution from Ships (MARPOL) introducing the mandatory global greenhouse gas reduction regime for the international industry sector were adopted at the 62nd session of the International Maritime Organization (IMO) Marine Environment Protection Committee (MEPC) in 2011 and entered into force on 1 January 2013.

A new Chapter 4 entitled *Regulations on Energy Efficiency for Ships* has been added to MARPOL Annex VI which mandates:

- an Energy Efficiency Design Index (EEDI) for certain new ships;
- a Ship Energy Efficiency Management Plan (SEEMP) for certain ships; and
- a requirement for certain ships to carry an International Energy Efficiency (IEE) Certificate.

The new chapter 4 applies to ships of 400 gross tonnage and above engaged in international voyages, however does not apply to some ships not propelled by mechanical means, and platforms including FPSOs and FSUs and drilling rigs, regardless of their propulsion.

Energy Efficiency Design Index (EEDI) for new ships

The EEDI is a non-prescriptive, performance-based mechanism that leaves the choice of technologies to use in a specific ship design to

the industry. As long as the required energy efficiency level is attained, ship designers and builders are free to use the most cost-effective solutions for the ship to comply with the regulations. The EEDI standards are being phased in from 2013 to 2025.

In general form, the EEDI formula may be expressed as:

EEDI = CO₂ emission/transport work where:

- the carbon-dioxide (CO₂) emission represents total CO₂ emission from combustion of fuel, including propulsion and auxiliary engines and boilers, taking into account the carbon content of the fuels in question; and
- the transport work is calculated by multiplying the ship's capacity as designed (deadweight for cargo ships and gross tonnage for passenger ships) with the ship's design speed measured at the maximum design load condition and at 75 per cent of the rated installed shaft power.

The 66th session of the MEPC agreed to extend the application of the EEDI regulations to "new" ships of the following types that use conventional propulsion methods:

- container ships
- refrigerated cargo carriers
- tankers
- combination carriers
- roll on roll off cargo ships
- general cargo ships
- gas carriers
- bulk carriers
- vehicle carriers
- roll on roll off passenger ships

These ships are required to have an 'attained EEDI' and will need to meet the EEDI regulations requiring an improvement in energy efficiency up to 2025.

A "new" ship means a ship:

- for which the building contract is placed on or after 1 January 2013; or
- in the absence of a building contract, the keel of which is laid or which is at a similar stage of construction on or after 1 July 2013; or
- the delivery of which is on or after 1 July 2015.

Conventional propulsion means a method of propulsion where a main reciprocating internal combustion engine(s) is the prime mover and coupled to a propulsion shaft, either directly or through a gear box.

Cruise passenger ships using non-conventional propulsion and LNG carriers using conventional or non-conventional propulsion, delivered on or after 1 September 2019, will also need to have an attained EEDI and meet the EEDI regulations requiring an improvement in energy efficiency up to 2025. Non-conventional propulsion methods include diesel-electric propulsion, turbine propulsion and hybrid propulsion systems. The EEDI regulations do not apply to cargo ships that have ice-breaking capability.

According to the IMO, the EEDI now covers approximately 85 per cent of the CO₂ emissions from international shipping.

Ship Energy Efficiency Management Plan (SEEMP) for all ships

The SEEMP establishes a mechanism for operators to improve the energy efficiency of ships. Potential operational efficiency measures include:

- improved hull and propulsion system maintenance;
- voyage planning;
- weather routing;
- speed optimisation; and
- use of automated engine management systems.

Each ship is required to keep a ship specific SEEMP on board, which may form part of the ship's Safety Management System.

The SEEMP for each ship is to be developed taking into account guidelines adopted by the IMO (see below).

A critical element to consider in developing a SEEMP is the need to set a goal to create an incentive for proper implementation, and then to increase commitment to the improvement of energy efficiency. The goal can take any form, such as the annual fuel consumption or a specific target of Energy Efficiency Operational Indicator (EEOI).

The EEOI developed by IMO (see below) is one of the internationally established tools to obtain a quantitative indicator of energy efficiency of a ship and/or fleet in operation, and can be used for this purpose.

International Energy Efficiency Certificate

All ships of 400 gross tons and above engaged in international voyages need to be issued with an International Energy Efficiency (IEE) Certificate. Owners and operators of Australian ships engaged in international trade should ensure the IEE Certificate is issued and available after the first intermediate or renewal survey, whichever is the first, on or after 1 January 2013. Classification Societies have been authorised to issue the certificates for Australian vessels.

Additional information

This Marine Notice provides only a summary of the new regulations. For further details on determining the requirements for each specific ship, please refer to MARPOL Annex VI and the MEPC Resolutions that have been developed to support these new regulations:

- Resolution MEPC.213(63) - 2012 Guidelines for the development of a Ship Energy Efficiency Management Plan (SEEMP)
- Resolution MEPC.231(65) – 2013 Guidelines for calculation of reference lines for use with the Energy Efficiency Design Index (EEDI)
- Resolution MEPC.233(65) - 2013 Guidelines for calculation of reference lines for use with the Energy Efficiency Design Index (EEDI) for cruise passenger ships having non-conventional propulsion

- Resolution MEPC.245(66) - 2014
Guidelines on the method of calculation of the attained Energy Efficiency Design Index (EEDI) for new ships;
- Resolution MEPC.254(67) - 2014
Guidelines on Survey and Certification of the Energy Efficiency Design Index (EEDI)

The IMO has also issued a number of circulars providing additional information on the new regulations. The relevant circulars are:

- MEPC.1/Circ.682 – Interim Guidelines for Voluntary Verification of EEDI
- MEPC.1/Circ.684 – Guidelines for Voluntary use of EEOI.

Copies of these Resolutions and circulars can be obtained from the IMO website or by contacting eps@amsa.gov.au.

The *Protection of the Sea (Prevention of Pollution from Ships) Act 1983, Navigation Act 2012* and Marine Part 97 give effect to the new regulations.

Please note that this Marine Notice is not intended to constitute legal advice and should not be relied on for that purpose.

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