



Marine Notice 12/2015  
Supersedes 14/2010

## Regulations for Air Emissions from Ships

The purpose of this Marine Notice is to provide general information on Annex VI of the International Convention for the Prevention of Pollution from Ships (MARPOL).

Annex VI of MARPOL contains regulations for the prevention of air pollution from ships and addresses the properties of marine fuels and engines, amongst other things. This Marine Notice focusses on MARPOL regulations that control emissions of sulphur oxides (SO<sub>x</sub>) and particulate matter, and nitrogen oxides (NO<sub>x</sub>). These controls are divided between those applicable inside Emission Control Areas (ECAs) and those applicable everywhere else.

In Australia these regulations are given effect in the *Protection of the Sea (Prevention of Pollution from Ships Act) 1983* and Marine Order 97 – *Marine pollution prevention – air pollution*.

### SO<sub>x</sub> and Particulate Matter Emissions

SO<sub>x</sub> and particulate matter emissions are a function of the sulphur content of fuel. Accordingly, the SO<sub>x</sub> control requirements in MARPOL Annex VI provide for a progressive global reduction in the sulphur content of marine fuels to reduce the emission of SO<sub>x</sub> and particulate matter from ships.

The current maximum sulphur content of fuel oil in areas other than ECAs is 3.5 per cent. This will be reduced to 0.5 per cent from 1 January 2020, subject to an International Maritime Organization (IMO) assessment on the global availability of fuel to meet this

standard. This assessment of availability of fuel oil study will begin late 2015 and is expected to be completed by late 2016.

The maximum sulphur content of fuel oil for ships operating in ECAs was reduced from 1.0 per cent to 0.1 per cent on 1 January 2015.

Four SO<sub>x</sub> ECAs have been designated by the IMO. These are the Baltic Sea, North Sea, the North American area (both east and west coasts of the United States and Canada) and the United States Caribbean Sea area.

Recognising that fuel oil required to meet the above SO<sub>x</sub> standards may not always be available, MARPOL Annex VI includes fuel oil availability provisions, which set out what actions apply should a ship not be able to obtain the fuel oil necessary to comply with a given requirement. Owners and operators should notify their Administration and the competent authority of the relevant port of destination when a ship cannot purchase compliant fuel oil. This should be done prior to arrival in the port.

In Australia, all local suppliers of fuel oil are required to be registered with AMSA, and are listed on the AMSA web site at [www.amsa.gov.au/environment/legislation-and-prevention/local-fuel-suppliers/](http://www.amsa.gov.au/environment/legislation-and-prevention/local-fuel-suppliers/)

As an alternative to using low SO<sub>x</sub> fuel oil MARPOL Annex VI also permits the use of “equivalent methods” to meet the prescribed sulphur fuel restrictions. Equivalent methods include the use of exhaust gas cleaning systems or “scrubbers”, which act to remove

the SOx directly from the ship exhaust. The use of an equivalent method needs to be at least as effective in terms of emission reductions as the fuel oil requirements outlined above. Australian shipowners / operators considering this option need to obtain approval from AMSA for Australian registered ships and should obtain a copy of the IMO Guidelines for Exhaust Gas Cleaning Systems (Resolution MEPC.184(59)) from AMSA (eps@amsa.gov.au).

## NOx regulations for marine diesel engines

The NOx control requirements of MARPOL Annex VI provide for progressive reductions in NOx emissions from marine diesel engines. NOx emissions are restricted to certain limits (Tier I, II and III) based on the ship's construction date and area of operation. Within each of these Tiers, the NOx emission limit is set based on the ship's rated engine speed.

The Tier I and II limits apply to marine diesel engines installed on ships constructed on or after 1 January 2000 and 1 January 2011 respectively. Replacement engines and additional engines installed on existing ships will be required to meet Tier II standards. These limits apply in all areas not designated as a NOx ECA.

The more stringent Tier III limits will apply to marine diesel engines installed on ships constructed on or after 1 January 2016 operating in existing NOx ECAs. Replacement engines installed on existing ships operating in NOx ECAs will be required to meet Tier III standards where possible. Additional engines will need to meet the Tier III standard.

There are currently two NOx ECAs - the North American area and the United States Caribbean Sea area.

For NOx ECAs designated in the future the Tier III controls will apply to marine diesel engines installed on ships constructed on or after the date of the adoption of such an ECA, or a later date as may be specified in the designation of the ECA.

These requirements are summarised in the following table.

Tiers for NOx limits	Effective date
Tier I*	January 1, 2000
Tier II*	January 1, 2011
Tier III*	January 1, 2016 (operating in existing ECAs) North American ECA and United States Caribbean Sea Area ECA

\*Please refer to resolution MEPC.176(58) for the set emission limit based on ships' rated engine speed.

The NOx emission limits for new engines will be met by engine manufacturers. When purchasing a new engine, shipowners and operators must ensure that the engine has been issued with an Engine International Air Pollution Prevention Certificate (EIAPP) to verify compliance.

### Tier III exceptions

The more stringent Tier III limits will be primarily met through technologies such as selective catalytic reduction (SCR) systems.

IMO recognised that current SCR technology could not be utilised by ships such as superyachts, and therefore agreed that ships less than 500GT but over 24m in length designed to be used solely for recreational purposes would not be required to meet the Tier III limits until 2021. This will allow time for the industry to develop appropriate technologies to meet this requirement.

### NOx standards for existing engines

Existing marine diesel engines installed on a ship constructed on or after 1 January 1990 but prior to 1 January 2000 are also required to comply with the Tier I limits where an Approved Method (for example, an engine upgrade kit) for that engine has been certified by an Administration of a party to MARPOL and IMO has been notified by the certifying party of such notification.

When an Approved Method has been certified, it is to be applied to all relevant engines on ships no later than the first renewal survey that occurs 12 months or more after IMO is notified. A publicly available list of Approved Methods and notification dates is maintained on the IMO Global Integrated Shipping Information System at <https://gisis.imo.org/Public/Default.aspx>

Where the owner or operator of an Australian registered ship is able to demonstrate to AMSA that an Approved Method is not commercially available, the above requirement may be extended so that it is installed on the ship no later than the next annual survey which falls after the Approved Method is commercially available.

### Additional Information

Ship owners and operators should note that this Marine Notice provides only a summary of MARPOL Annex VI requirements relating to sulphur oxides and particulate matter and nitrogen oxides. Further details on determining the requirements for a specific ship can be found in MARPOL Annex VI, the NOx Technical Code 2008, and the following MEPC Resolutions that have been developed to support these regulations:

- Resolution MEPC.251(66) - Amendments to MARPOL Annex VI and the NOx Technical Code 2008
- Resolution MEPC.243(66) – 2014 Guidelines on the Approved Method Process
- Resolution MEPC.230(65) – 2013 Guidelines as required by Regulation 13.2.2 of MARPOL Annex VI in respect of non-identical replacement engines not required to meet the Tier III limit

- Resolution MEPC.198(62) – 2011 Guidelines addressing additional aspects to the NOx Technical Code with regard to particular requirements related to marine diesel engines fitted with selective catalytic reduction (SCR) systems
- Resolution MEPC.184(59) – 2009 Guidelines for Exhaust Gas Cleaning Systems
- Resolution MEPC.182(59) – 2009 Guidelines for the sampling of fuel oil for determination of compliance with the revised Annex VI
- Resolution MEPC.176(58) – Amendments to the Annex of the Protocol of 1997 to amend the international Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (Revised MARPOL Annex VI)

Copies of these Resolutions can be obtained from the IMO website or by contacting [eps@amsa.gov.au](mailto:eps@amsa.gov.au).

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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