



Marine Notice 2017/5  
Supersedes 2015/12

## Regulations for Air Emissions from Ships

### Purpose

The purpose of this Marine Notice is to provide general information to shipowners, masters and crews 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.

This Marine Notice focusses on MARPOL Annex VI 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 IMO designated Emission Control Areas (ECAs) and those applicable elsewhere.

This notice is issued as general guidance only and should be read in conjunction with the relevant Acts, Marine Orders and Standards. This document does not constitute legal advice and is not a substitute for independent professional advice.

This Marine Notice supersedes Marine Notice 2015/12.

### 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. The SO<sub>x</sub> control requirements in MARPOL Annex VI provide for a progressive global reduction in the sulphur content of fuel oil to reduce the emission of SO<sub>x</sub> and particulate matter from ships.

The current maximum sulphur content of fuel oil for ships operating in areas other than ECAs is 3.5% m/m (mass/mass). This limit will be reduced to 0.5% m/m from 1 January 2020. This reduction follows an International Maritime Organization (IMO) commissioned study<sup>1</sup> to review the global and regional demand for, and supply of, fuel oil complying with the 0.5% m/m limit. More information on the new sulphur content limit can be found in Marine Notice 2017/02.

The maximum sulphur content of fuel oil for ships operating in ECAs is 0.1% m/m. 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.

MARPOL Annex VI provides provisions for when a ship, despite best efforts, cannot purchase compliant fuel oil during its planned voyage. In this case, the ships' owners and operators must notify their Administration (for Australian vessels, AMSA) and the competent authority of the relevant port of destination prior to arrival in the port.

In Australia, local fuel oil suppliers are required to be registered with AMSA, and are listed on the AMSA web site.

<sup>1</sup> Further information on the IMO Commissioned Study is available at [www.imo.org](http://www.imo.org).

As an alternative to using low sulphur fuel oil, MARPOL Annex VI also permits the use of “equivalent methods” to meet sulphur emission restrictions. Equivalent methods include the use of exhaust gas cleaning systems, or “scrubbers”, which act to remove the SO<sub>x</sub> 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. Owners or operators of Australian vessels considering this option need to obtain approval from AMSA and should also review the IMO Guidelines for Exhaust Gas Cleaning Systems (Resolution MEPC.259(68)).

Special conditions also apply to certain cruise vessels berthed in Sydney Harbour. In accordance with directions issued by AMSA, affected cruise vessels are required to either use fuel with a sulphur content not exceeding 0.1% m/m; use a certified and approved Exhaust Gas Cleaning System; use a power source external to the vessel; or use a combination of these measures. More information can be found in Marine Notice 2016/21.

## NO<sub>x</sub> Regulations for Marine Diesel Engines

Regulations in MARPOL Annex VI provide for progressive reductions in NO<sub>x</sub> emissions from marine diesel engines, with a power output of more than 130 kW, installed on a ship. NO<sub>x</sub> emissions are restricted to certain limits (Tier I, II and III) based on the ship’s construction date; date of major conversion<sup>2</sup>; and area of operation. Within each of these Tiers, the NO<sub>x</sub> emission limit is set based on the ship’s rated engine speed (crankshaft rpm).

The Tier I and II limits apply to marine diesel engines installed on ships constructed, or undergoing a major conversion, on or after 1 January 2000 and 1 January 2011 respectively. Replacement engines and additional engines installed on existing ships are required to meet Tier II standards, unless they meet the defined criteria for an ‘identical engine’<sup>3</sup>.

These limits apply in all areas not designated as a NO<sub>x</sub> ECA. Standards for existing ships are outlined in further detail below.

The more stringent Tier III limits apply to marine diesel engines installed on ships constructed on or after 1 January 2016 operating in existing NO<sub>x</sub> ECAs. Replacement engines installed on existing ships operating in NO<sub>x</sub> ECAs are required to meet Tier III standards where possible. Additional engines must meet the Tier III standard.

There are currently two NO<sub>x</sub> ECAs - the North American area and the United States Caribbean Sea area.

For additional NO<sub>x</sub> ECAs designated in the future, Tier III controls will apply to 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, when operating in the area.

These requirements are summarised in the following table.

Tiers for NO <sub>x</sub> limits	Effective date
Tier I*	On or after January 1, 2000
Tier II*	On or after January 1, 2011
Tier III*	On or after 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.

When purchasing a new marine diesel engine with a power output of more than 130 kW, shipowners and operators must ensure that the engine has been issued with an Engine International Air Pollution Prevention Certificate (EIAPP) and its supporting engine Technical File<sup>4</sup> to verify compliance.

<sup>2</sup> For definition of a ‘major conversion see MARPOL Annex VI, reg. 13 para. 2.1 and 2.2

<sup>3</sup> See the Unified Interpretations (UI) to the Revised MARPOL Annex VI, paragraph 6- Identical replacement engines.

<sup>4</sup> See the IMO NO<sub>x</sub> Technical Code (2008), Chapter 2, section 2.4.1 for the contents of a Technical File.

## Tier III Exceptions

The Tier III NO<sub>x</sub> emission limits will be primarily met through technologies such as selective catalytic reduction (SCR) systems.

The IMO, in recognising that current SCR technology cannot be used by ships such as superyachts, agreed that ships less than 500GT, but over 24m in length, designed to be used solely for recreational purposes are not required to meet the Tier III limits until 2021 (refer to MEPC.251(66) for more information). This will allow time for the industry to develop appropriate technologies to meet this requirement.

## NO<sub>x</sub> Standards for Existing Engines

Existing marine diesel engines with a power output of more than 5,000 kW, and a per cylinder displacement at or above 90 litres, installed on a ship constructed on or after 1 January 1990 but prior to 1 January 2000, are also required to comply with Tier I limits. To achieve compliance, such existing marine diesel engines must also have an Approved Method (for example, an engine upgrade kit) certified by an Administration, and the IMO needs to be notified.

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 online in the IMO Global Integrated Shipping Information System (GISIS). Where the owner or operator of an Australian 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.

## Further 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.

Details on determining the requirements for a specific ship can be found in MARPOL Annex VI, the NO<sub>x</sub> Technical Code 2008 as amended, and the following MEPC Resolutions that have been developed to support these regulations:

- Resolution MEPC.251(66) - Amendments to MARPOL Annex VI and the NO<sub>x</sub> Technical Code 2008 (relating to the application of the Energy Efficiency Design Index (EEDI) to a wide range of ship types and certification of dual-fuel engines);
- 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 NO<sub>x</sub> Technical Code with regard to particular requirements related to marine diesel engines fitted with selective catalytic reduction (SCR) systems;
- Resolution MEPC.259(68) – 2015 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) (set NO<sub>x</sub> emission limit based on ships' rated engine speed).

Copies of these Resolutions can be obtained from the IMO website.

Gary Prosser  
Deputy Chief Executive Officer  
Australian Maritime Safety Authority  
March 2017

GPO Box 2181  
CANBERRA ACT 2601

File No: 2017/1249