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## **Revised Annex VI of MARPOL: Prevention of Air Pollution from Ships**

**Notice to all Masters, Chief Engineers, Seafarers, Owners, Companies, Charterers, Ports, Local Suppliers of Fuel Oil**

*This notice should be read in conjunction with the Merchant Shipping (Prevention of Air Pollution from Ships) Regulations 2008 and the Merchant Shipping (Prevention of Air Pollution from Ships) (Amendment) Regulations 2010*

*This MIN expires 10 July 2011*

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### **Summary**

The purpose of this Marine Information Note is to advise of changes to Annex VI of the International Convention for the Prevention of Pollution from Ships (MARPOL) and the NOx Technical Code 2008 which entered into force internationally on 1 July 2010.

1. The purpose of this Marine Information Note is to advise of changes to Annex VI of the International Convention for the Prevention of Pollution from Ships (MARPOL) (IMO Resolution MEPC.176(58)) and the NOx Technical Code 2008 (IMO Resolution MEPC.177(58)) which entered into force internationally on 1 July 2010.

### SOx and Particulate Matter Emissions

2. It is generally recognised that SOx emissions are a function of the sulphur content of fuel. Reducing sulphur content will also result in lower particulate matter emissions. The current global cap of 4.50 % sulphur content will be reduced to 3.50 % from 1 January 2012, and further reduced to 0.50 % from 1 January 2020. (However this will be subject to a review on availability of fuel to be completed no later than 2018).
3. With regard to SOx emission control areas, the current cap of 1.50 % sulphur content has been reduced to 1.00 % from 1 July 2010, and 0.10 % from 1 January 2015.
4. A fuel availability provision has also been included in the revised Annex VI that sets out what actions apply should a ship be unable to obtain the fuel necessary to comply with a given requirement.

### NOx regulations for new engines

5. The revised Annex VI also provides for progressive reductions in NOx emissions from marine engines. The new limits represent a reduction of approximately 20 % over the current standard stipulated in the existing Annex VI (Tier I) levels and will apply to ships constructed on or after 1 January 2011 (to be known as Tier II limits). For engines installed on ships

constructed on or after 1 January 2016 operating in a NO<sub>x</sub> emission control area, a further reduction of around 80 % will apply (Tier III limits). Outside a designated Emission Control Area, the Tier II limits will apply. This three tier approach is set out below:

### **Tier I (identical to today's limits)**

6. For diesel engines installed on ships constructed from 1 January 2000 to 1 January 2011, the allowable NO<sub>x</sub> emissions are:

- 17.0g/kWh when n is less than 130 rpm
- 45.0 n(-0.2) g/kWh when n is 130 rpm or more but less than 2000 rpm
- 9.8 g/kWh when n is 2000 rpm or more

### **Tier II**

7. For diesel engines installed on ships constructed on or after 1 January 2011, the allowable NO<sub>x</sub> emissions are:

- 14.4g/kWh when n is less than 130 rpm
- 44.0 n(-0.23) g/kWh when n is 130 rpm or more but less than 2000 rpm
- 7.7 g/kWh when n is 2000 rpm or more

### **Tier III**

8. Ships constructed on or after 1 January 2016 will have additional limitations when operating in an Emission Control Area (ECA). No ECAs have yet been designated for NO<sub>x</sub> emissions, but it is expected that both the Baltic Sea and North Sea will be designated as NO<sub>x</sub> ECAs well ahead of 1 January 2016.

For Tier III ships operating in the NO<sub>x</sub> ECAs, the allowable NO<sub>x</sub> emissions are:

- 3.4g/kWh when n is less than 130 rpm
- 9.0 n (-0.2) g/kWh when n is 130 rpm or more but less than 2000 rpm
- 2.0 g/kWh when n is 2000 rpm or more

9. The more stringent Tier III standards are expected to be met through technologies such as water induction into the combustion process, exhaust gas recirculation, and selective catalytic reduction. These technologies are under development.

### NOx standards for existing engines

10. Under the revised Annex VI a NOx emission limit of 17.0 g/kW is applied to a diesel engine with a power output of more than 5,000 kW and a displacement per cylinder at, or above, 90 litres installed on a ship constructed on or after 1 January 1990 but prior to 1 January 2000. However, this retrospective requirement is applicable only 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 notification of such certification has been submitted to IMO by the certifying Administration. Certification of an approved method is to be in accordance with the NOx Technical Code 2008. Further, certification is to include verification:

- by the designer of the base marine diesel engine to which the approved method applies that the calculated effect of the approved method will not decrease engine rating by more than 1.0%, increase fuel consumption by more than 2.0%, or adversely affect engine durability or reliability; and
- that the cost of the approved method is not excessive, as determined by a comparison of the amount of NOx reduced by the approved method and the cost of purchasing and installing such approved method.

11. It should also be noted that, where an approved method has been submitted to IMO for a particular engine, as outlined above, the approved method is to be applied no later than the first renewal survey that occurs 12 months or more after the documents are deposited with IMO.

### Certification

12. The revised NOx Technical Code 2008 shall be applied in the certification, testing, and measurement procedures for the standards set forth in this regulation.

13. The procedures for determining NOx emissions set out in the revised NOx Technical Code 2008 are intended to be representative of the normal operation of the engine. Defeat devices and irrational emission control strategies undermine this intention and shall not be allowed. This regulation shall not prevent the use of auxiliary control devices that are used to protect the engine and/or its ancillary equipment against operating conditions that could result in damage or failure or that are used to facilitate the starting of the engine.

### Ozone-depleting substances

14. The revised Annex VI does not apply ozone-depleting substances to permanently sealed equipment where there are no refrigerant charging connections or potentially removable components containing ozone-depleting substances.

15. The revision prohibits the use of installations which contain ozone-depleting substances (other than hydrochlorofluorocarbons) on ships constructed on or after 19 May 2005 or in the case of ships constructed before 19 May 2005, which have a contractual delivery date of the equipment to the ship on or after 19 May 2005.

16. Installations that contain hydrochlorofluorocarbons shall be prohibited:

- on ships constructed on or after 1 January 2020; or
- in the case of ships constructed before 1 January 2020, which have a contractual delivery date of the equipment to the ship on or after 1 January 2020 or, in the absence of a contractual delivery date, the actual delivery of the equipment to the ship on or after 1 January 2020.

17. There is a revised format within the supplement to the International Air Pollution Prevention Certificate in listing the equipment containing ozone-depleting substances.

18. One further requirement is that from 1 July 2010, each ship which has a rechargeable system that contains ozone-depleting substances shall have an ozone-depleting substances record book. Entries in the record book shall be completed without delay on each occasion in respect of the following:

- Recharging full or partial, of equipment containing ozone-depleting substances
- Repair or maintenance of equipment containing ozone-depleting substances
- Discharge of ozone-depleting substances to the atmosphere both deliberate and non-deliberate.
- Discharge of ozone-depleting substances to land based reception facilities
- Supply of ozone-depleting substances to the ship

The Ozone-depleting Substances Record Book may be part of an existing log-book.

#### Volatile Organic Compounds

19. The revised MARPOL Annex VI has introduced a new mandatory requirement (regulation 15.6) regarding Volatile Organic Compounds (VOC) emissions control.

20. With effect from July 1, 2010, every tanker carrying crude oil is required to have on board and implement a VOC Management Plan, approved by the Administration.

## More Information

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