

Action code: **WHEN CONVENIENT**

IMO Revised MARPOL Annex VI
Approved Methods for Pre-2000 Marine Engines

SL09-520/KEA
 November 2009

Concerns

Owners and operators of MAN B&W two-stroke marine diesel engines.
 Type: MC/MC-C

Summary

Information on how MAN Diesel will act on the Approved Method regulations, which are part of the new IMO regulations.

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Dear Sirs

In November 2008, amendments to the existing regulations for control of ship emissions were finally adopted by IMO (International Maritime Organisation). The revised MARPOL Annex VI and NO_x Technical Code 2008 will enter into force on 1 July 2010.

This Service Letter describes IMO's Approved Methods for pre-2000 marine engines as well as MAN Diesel's preparation for adaption and expectations to the introduction of the new regulations.

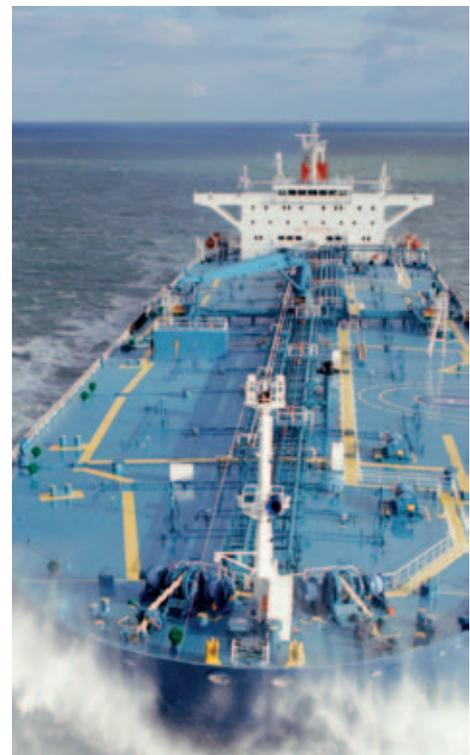
Yours faithfully



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NO_x regulations for existing engines

The revised regulations cover a large range of issues concerning emissions from ships, i.e. Tier II and Tier III NO_x regulations for new ships and SO_x regulations for all ships.

As an addition to the regulations, NO_x emissions from engines installed on ships with keel laying between 1 January 1990 and 31 December 1999 are regulated by the so-called Approved Method regulations for existing engines.

The regulations apply to engines with a cylinder compression volume at or above 90 litres and a maximum continuous rating above 5,000 kW (all MAN B&W low speed engines of 42 bore and above, and some 35 bore, are within these ranges), but only if a certified Approved Method is available.

Until now, engines installed on ships built prior to 1 January 2000, and not subject to major modification, have not been required to fulfil any NO_x limits, and no NO_x Technical File has been issued to document the level of NO_x emissions for engines built in this period.

What is an Approved Method

An Approved Method is a method that documents that it will bring an engine in compliance with the present Tier I NO_x limits.

Regulatory requirements to an Approved Method

The regulations require that the designer of the base engine must verify that the Approved Method will not decrease the engine rating by more than 1%, increase fuel oil consumption by more than 2% and not adversely affect engine durability or reliability.

Also, a cap on the cost of parts and installation are included in the regulations.

Approved Methods for MAN B&W engines will not result in de-rating of the engine. Fuel oil consumption will remain the same or, in some cases, be slightly improved. Engine durability and reliability will not suffer, actually only improve.

What is an Approved Method for MAN B&W engines

An Approved Method developed by MAN Diesel comprises a slide fuel valve upgrade and documentation. An Approved Method File (AMF) will be issued. The AMF is similar to a NO_x Technical File issued for engines built after 2000, but in a reduced format. Included in the AMF is the NO_x level of the engine, configuration of NO_x influencing components (retrofit parts) and a method for assuring continued compliance with the NO_x limit (the survey method).

Slide valves are well proven technology for new engines and for retrofit. In addition to the lower NO_x emission, the retrofit will ensure a range of additional benefits:

- decreased particulate matter emission
- cleaner combustion chamber
- improved cylinder condition
- cleaner exhaust gas pathways
- improved low load operation performance
- smokeless operation.

Adjustment and verification of the engine performance are necessary and should, preferably, be carried out by a service engineer.

Required documentation

Two main sets of documentation are part of the regulations:

- The Approved Method Application. This document will be prepared by MAN Diesel. It is to be certified by an IMO Administration, and most likely one or more IACS classes on behalf of the Administration.
- The Approved Method File. This document is the 'Technical File' for the individual engine and will be prepared by MAN Diesel with data filled in by the supplier of the already Approved Method before the engine is surveyed. It must be issued when the engine is upgraded. It is to be approved by the ship Flag State or most likely by a class on its behalf.

Approved Method Application

MAN Diesel will prepare Approved Method Applications for a range of engine models. An Approved Method Application will contain information on a number of issues:

- Which engines the Approved Method applies to
- Which parts and adjustments are needed
- What the NO_x level of the engine will be
- How fuel oil consumption is affected
- Calculation of the cost of the Approved Method
- How the Approved Method File looks, and how continued compliance with the regulations is assured.

When an Approved Method Application has been approved by the authorities, IMO will be notified and information released.

Individual Approved Method documentation

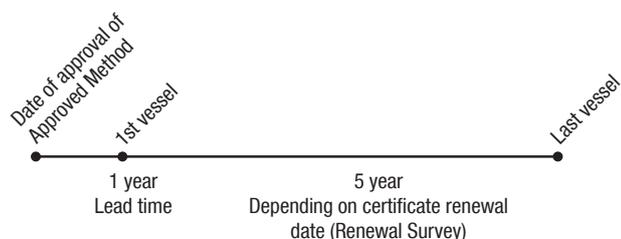
On the basis of this Approved Method Application, the engines covered can be upgraded individually when the Approved Method has been certified, and an Approved Method File for the engine has been issued, allowing the ship IAPP certificate to be amended. Different Approved Methods will be introduced for different engine types.

When does an engine comply with the new regulations

The regulations will enter into force on 1 July 2010. An Approved Method can only be approved from this date and will cover the range of engines defined in the description of the Approved Method.

IMO MARPOL Annex VI specifies that the regulations for the pre-2000 engines must apply no later than by the first renewal survey that occurs 12 months, or later, after notification of the methods for the various engines. This means that the operator is not forced to apply a method for his engine until a certified method is available. When an Approved Method has been certified, IMO will be notified. Information on the Approved Method will be available one year before it has to be installed on the first vessel.

Timeline of application for vessel covered



A specific vessel must comply with the regulations when an Approved Method covering the engine has been certified, and depending on the date of the renewal survey of the vessel. The following figure shows an example of two Approved

Method certification dates combined with different dates of vessel renewal survey. A renewal survey takes place once every five years.

Examples of Renewal Survey Dates				
	Dates	30 June 2011	1 July 2011	1 January 2012
Approved Method available	1 July 2010	–	+	+
	1 Dec. 2010	–	–	+

- + Upgrade required
- Upgrade not required

Alternative to installing an Approved Method

Measurements of NO_x onboard verifying the Tier I emission level can replace an Approved Method. Approved Methods will only be made available for engines not complying with the emission limits.

For engines already upgraded with slide fuel valves, requirements to meet the regulations will be evaluated on a case by case basis.

How will MAN Diesel support operators

MAN Diesel PrimeServ will provide information on when an Approved Method is available for the individual engine types. Due to the necessary development work, only a limited range of Approved Methods will be available as of July 2010. The initial focus will be on the engine types produced in the largest numbers.

MAN Diesel PrimeServ is able to assist in performance analyses, engine performance optimisation and delivery of the high technology giving the optimum advantages mentioned above while being in compliance with the new regulations.

Please do not hesitate to contact MAN Diesel PrimeServ for further information on PrimeServ-cph@mandiesel.com.