

# TÜRK LOYDU



## UNIFIED INTERPRETATIONS\* for the IMPLEMENTATION of MARPOL ANNEX VI and NOx TECHNICAL CODE

**2015**

This latest edition incorporates all rule changes. The latest revisions are shown with a vertical line. The section title is framed if the section is revised completely. Changes after the publication of the rule are written in red colour.

Unless otherwise specified, these Rules apply to ships for which the date of contract for construction as defined in IACS PR No.29 is on or after 01<sup>st</sup> of January 2015. New rules or amendments entering into force after the date of contract for construction are to be applied if applicable. See Rule Change Notices on TL website for details.

"General Terms and Conditions" of the respective latest edition will be applicable (see Rules for Classification and Surveys).

If there is a difference between the rules in English and in Turkish, the rule in English is to be considered as valid. This publication is available in print and electronic pdf version.

Once downloaded, this document will become UNCONTROLLED. Please check [www.turkloydu.org](http://www.turkloydu.org) for the amended and valid version.

All rights are reserved by Türk Loydu, and content may not be reproduced, disseminated, published, or transferred in any form or by any means, except with the prior written permission of TL.

\*In statutory matters, when authorized by the Administration concerned and acting on its behalf, the Society applies the available IACS Unified Interpretations (UIs), unless the Administration provides another interpretation or decides otherwise.

## **TÜRK LOYDU**

**Head Office** Postane Mah. Tersaneler Cad. No:26 Tuzla 34944 İSTANBUL / TÜRKİYE  
Tel : (90-216) 581 37 00  
Fax : (90-216) 581 38 00  
E-mail : [info@turkloydu.org](mailto:info@turkloydu.org)  
<http://www.turkloydu.org>

### **Regional Offices**

**Ankara** Eskişehir Yolu Mustafa Kemal Mah. 2159. Sokak No : 6/4 Çankaya - ANKARA / TÜRKİYE  
Tel : (90-312) 219 56 34  
Fax : (90-312) 219 68 25  
E-mail : [ankara@turkloydu.org](mailto:ankara@turkloydu.org)

**İzmir** Atatürk Cad. No :378 K.4 D.402 Kavalalılar Apt. 35220 Alsancak - İZMİR / TÜRKİYE  
Tel : (90-232) 464 29 88  
Fax : (90-232) 464 87 51  
E-mail : [izmir@turkloydu.org](mailto:izmir@turkloydu.org)

**Adana** Çınarlı Mah. Atatürk Cad. Aziz Naci İş Merkezi No:5 K.1 D.2 Seyhan - ADANA / TÜRKİYE  
Tel : (90- 322) 363 30 12  
Fax : (90- 322) 363 30 19  
E-mail : [adana@turkloydu.org](mailto:adana@turkloydu.org)

**Marmaris** Atatürk Cad. 99 Sok. No:11 Kat:4 Daire 6 Marmaris - MUĞLA / TÜRKİYE  
Tel : (90- 252) 412 46 55  
Fax : (90- 252) 412 46 54  
E-mail : [marmaris@turkloydu.org](mailto:marmaris@turkloydu.org)

**MPC****12**

(July 2004)

(Rev.1

Mar 2006)

(Rev.2

Apr 2014)

(Corr.1

June

2014)

**Annex VI of MARPOL 73/78****Regulation 1***Application*

Regulation 1 reads as follows:

The provisions of this Annex shall apply to all ships, except where expressly provided otherwise in regulations 3, 5, 6, 13, 15, 16, 18, 19, 20, 21 and 22 of this Annex.

**Interpretation:**

For application of this regulation the term "all ships" shall be interpreted as applicable to all ships as defined by MARPOL 73 Article 2 (4).

**Note:**

1. This UI is to be uniformly implemented by IACS Societies from 19 May 2005.
2. Revision 1 of this UI is to be uniformly implemented by IACS Societies from 1 July 2006.
3. Rev.2 of the UI is to be uniformly implemented by IACS Societies from 1 January 2015.

**MPC****13**

(July 2004)

(Rev.1

Mar 2006)

**Annex VI of MARPOL 73/78****Regulation 2 (4)**

Deleted Nov 2013.

The interpreted text was deleted from the revised Annex as per MEPC.176(58), instead regs 12.3.1 & 12.3.2 now cover the points as given by this UI.

(IACS Ref. 8657\_)

**MPC****14**

(July 2004)

(Rev.1

Apr 2014)

(Corr.1

June

2014)

**Annex VI of MARPOL 73/78****Regulation 1 / Regulation 5.2***Application / Surveys and Inspections*

Regulation 1 reads as follows:

The provisions of this Annex shall apply to all ships, except where expressly provided otherwise in regulations 3, 5, 6, 13, 15, 16, 18, 19, 20, 21 and 22 of this Annex.

Regulation 5.2 reads as follows:

In the case of ships of less than 400 gross tonnage, the Administration may establish appropriate measures in order to ensure that the applicable provisions of chapter 3 are complied with.

**Interpretation:**

It shall be interpreted that all marine diesel engines over 130 kW except those exempted by Regulation 3 or Regulation 13 are to comply with the Regulation 13 limit regardless of the gross tonnage of the ship onto which the engine is installed. In this context such engines must have an approved Technical File and must be issued with an EIAPP certificate in accordance with the NOx Technical Code in all cases.

However the application of the ship surveys as given in Regulation 5.2 to ships under 400 GT would be at the discretion of the relevant Administration.

Note:

1. This UI is to be uniformly implemented by IACS Societies from 19 May 2005.
2. Rev.1 of the UI is to be uniformly implemented by IACS Societies from 1 January 2015.

## **MPC**

### **15**

(July 2004)

#### **Annex VI of MARPOL 73/78**

##### **Regulation 9 (4) (b)**

Deleted Nov 2013.

The interpreted text no longer exists within either Regulation 2 or elsewhere with Chapter 2 of the Annex.  
(IACS Ref. 8657\_)

## **MPC**

### **16**

(July 2004)

#### **Annex VI of MARPOL 73/78**

##### **Regulation 13 (1) (a) (i) / Regulation 13**

*Nitrogen oxides (NO<sub>x</sub>)*

Regulation 13 (1) (a) (i) reads as follows:

This regulation shall apply to each diesel engine with a power output of more than 130kW which is installed on a ship constructed on or after 1 January 2000.

##### **Interpretation:**

For application of this regulation it shall be interpreted that the term "installed" relates to an engine that is permanently secured or connected to the ship's structure, fuel / coolant / exhaust systems or power systems.

Note:

1. This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

## **MPC**

### **17**

(July 2004)

#### **Annex VI of MARPOL 73/78**

##### **Regulation 13 (1) (a) (ii)**

Deleted Nov 2013.

Noting that MPC 98 re '...time of replacement or addition ...' has defined the date as applicable to a Major Conversion representing the installation of an engine which was not previously installed onboard.

The text of the Supplement to the IAPP Cert has been revised so that the previously given clause '1.7 - Date of commencement of major engine conversion (if applicable)(regulation 13)' has been deleted hence removing the need for this UI.

Additionally, the Tier applicable in either of the scenarios now given by reg 13.2.1.2 or 13.2.1.3 in which the original engine frame is retained (irrespective of whether those particular forms of 'Major Conversion' are undertaken onboard or ashore) is given reg 13.2.3.  
(IACS Ref. 8657\_)

## **MPC**

### **18**

(July 2004)

(Rev.1

Mar 2006)

#### **Annex VI of MARPOL 73/78**

##### **Regulation 13 (1) (b) (i)**

Deleted Nov 2013.

The text of reg 13.1.2.1 incorporates the point raised by this UI.

(IACS Ref. 8657\_)

## **MPC**

### **19**

(July 2004)

#### **Annex VI of MARPOL 73/78**

#### **Regulation 13 (1) (c) / Regulation 13**

Deleted Nov 2013.

The text in which the error occurred which gave rise this UI has now been duly corrected – reg 13.1.3.

(IACS Ref. 8657\_)

## **MPC**

### **20**

(July 2004)

(Rev.1

Apr 2014)

#### **Annex VI of MARPOL 73/78**

#### **Regulation 13.2.1.1 and 13.2.2**

Application

Regulation 13.2.1.1 reads as follows:

For the purpose of this regulation, major conversion means a modification on or after 1 January 2000 of a marine diesel engine that has not already been certified to the standards set forth in paragraph 3, 4, or 5.1.1 of this regulation where:

.1 the engine is replaced by a marine diesel engine or an additional marine diesel engine is installed, or ....

Regulation 13.2.2 reads as follows:

For a major conversion involving the replacement of a marine diesel engine with a nonidentical marine diesel engine or the installation of an additional marine diesel engine, the standards in force at the time of the replacement or addition shall apply.

#### **Interpretation**

This section shall be interpreted, in respect of engines installed on or after 1 January 2000 but before 1 July 2010\*, on the basis of regulation 13(2)(a)(i) which applied at that time in which it was given that "For the purpose of this regulation, major conversion, means a modification of an engine where the engine is replaced by a new engine built on or after 1 January 2000." follows:

(a) For application of regulation 13(2)(a)(i) the term "replaced" shall be interpreted as being applicable to an engine installed either as a direct replacement for an existing engine or one installed as an addition to the original engine complement as at 1 January 2000 to meet revised ship requirements; and,

(b) For application of regulation 13(2)(a)(i) the term "new" shall be interpreted as applying to engines that left the manufacturer's works for the first time on or after 1 January 2000.

\* For IACS interpretation of "date of installation" see MPC 98

Note:

1. This UI is to be uniformly implemented by IACS Societies from 19 May 2005.
2. Rev.1 of the UI is to be uniformly implemented by IACS Societies from 1 January 2015.

## **MPC**

### **21**

(July 2004)

(Rev.1

Mar 2006)

#### **Annex VI of MARPOL 73/78**

#### **Regulation 13 (2) (a) (iii)**

Deleted Nov 2013.

Reg 13.2.1.3 now covers the point raised by this UI by reference to the engine's '...original certification...'.  
(IACS Ref. 8657\_)

**MPC****22**

(July 2004)

**Annex VI of MARPOL 73/78****Regulation 13 (3) (a)**

Deleted Nov 2013.

3.1.3 of NTC 2008 now covers the point raised by this UI in that it gives that both the limit value and the engine's NOx emission value are to be given to 1 dp.  
(IACS Ref. 8657\_)

**MPC****23**

(July 2004)

**Annex VI of MARPOL 73/78****Regulation 13 (3) (b)**

Deleted Nov 2013.

Reg 13.8 now clearly gives that the NOx Technical Code 2008 is to be applied in all cases.

2.2.5.1 of NTC 2008 gives that the 'engine' is the 'engine + NOx reducing device'

Where there are Guidelines (such as those given by MEPC.198(62) – SCR Guidelines) which affect the application of the Code those Guidelines are explicitly referenced in the Code, as in the amendment to 2.2.5.1 as given by MEPC.217(63).  
(IACS Ref. 8657\_)

**MPC****24**

(July 2004)

**Annex VI of MARPOL 73/78****Regulation 14 (6)**

Deleted Nov 2013.

Reg 14.6 as now given by MEPC.176(58) exactly covers the point raised by this UI.  
(IACS Ref. 8657\_)

**MPC****25**

(July 2004)

**Annex VI of MARPOL 73/78****Regulation 16 (2) (a)**

Deleted Nov 2013.

Reg 16 as now given by MEPC.176(58) now includes the '..ship constructed ...' clause and hence that point is fully covered in respect of new construction.

In terms of existing ships, at January 2000, the term '...installed...' is used and while that is not as detailed as the corresponding text now given in regs 12.3.1 and 12.3.2 (or in MPC 98 as regards the '..time of replacement or addition...') however, this issue may be considered to be sufficiently in the past that it is not now necessary to retain this UI.

(IACS Ref. 8657\_)

**MPC****26**

(July 2004)

**Annex VI of MARPOL 73/78****Regulation 16 (6)**

Deleted Nov 2013.

The \* footnote to Reg 16.3 as now given by MEPC.176(58) exactly covers the point raised by this UI.  
(IACS Ref. 8657\_)

## MPC

### 27

(July 2004)

#### Annex VI of MARPOL 73/78

#### Regulation 16 (7)

Deleted Nov 2013.

It should be noted that the layout of reg 16 in total was revised by MEPC.176(58) in order to provide a more logical arrangement.

Hence Reg 16.7 which now covers this point makes specific reference to only being applicable to those incinerators required by Reg 16.6.1.

(IACS Ref. 8657\_)

## MPC

### 29

(July 2004)

(Rev.1

Apr 2014)

#### Annex VI of MARPOL 73/78

#### Regulation 18.5 and 18.6

Application

Regulation 18.5 reads as follows:

For each ship subject to regulations 5 and 6 of this Annex, details of fuel oil for combustion purposes delivered to and used on board shall be recorded by means of a bunker delivery note that shall contain at least the information specified in appendix V to this Annex.

Regulation 18.6 reads as follows:

The bunker delivery note shall be kept on board the ship in such a place as to be readily available for inspection at all reasonable times. It shall be retained for a period of three years after the fuel oil has been delivered on board.

#### Interpretation:

For application of these regulation it shall be interpreted as applicable to all ships of 400 gross tonnage or above and, at the Administration's discretion, for ships of less than 400 gross tonnage.

Note:

1. This UI is to be uniformly implemented by IACS Societies from 19 May 2005.
2. Rev.1 of the UI is to be uniformly implemented by IACS Societies from 1 January 2015.

## MPC

### 30

(July 2004)

#### Resolution 2 of the 1997 MARPOL Conference

#### Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

#### Table 3 – Symbols and subscripts for terms and variables used in the formulae for the test-bed measurement methods

Table 3 gives:

Symbol	Term	Dimension
$P_a$	Saturation vapour pressure of the engine intake air (in ISO 3046-1, 1995: $P_{sy} = P_{SY}$ , test ambient vapour pressure)	$kP_a$

$P_B$	Total barometric pressure (in ISO 3046-1, 1995: $p_X = P_X$ , site ambient total pressure; $p_Y = P_Y$ , test ambient total pressure)	$kP_a$
$P_S$	Dry atmospheric pressure	$kP_a$
$R_a$	Relative humidity of the intake air	%
$T_a$	Absolute temperature of the intake air	K

**Interpretation:**

For application of the term “ps” it shall be interpreted that the dry atmospheric pressure is determined in accordance with the following formula:

$$P_S = P_B - \frac{R_a \cdot P_a}{100}$$

It shall also be interpreted that the  $p_a$  term be determined using a temperature value for the intake air measured at the same physical location as the measurements for  $p_B$  and  $R_a$ .

**Interpretation:**

For application of the term “ $T_a$ ” it shall be interpreted that the temperature of the intake air temperature is that determined at the engine / turbocharger intake suction filter.

**Note:**

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC****31**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

**Chapter 1.2.1****Chapter 1.2***Application*

Chapter 1.2.1 reads as follows:

This Code applies to all diesel engines with a power output of more than 130 kW which are installed, or are designed and intended for installation, on board any ship subject to Annex VI, with the exception of those engines described in paragraph 1(b) of regulation 13. Regarding the requirements for survey and certification under regulation 5 of Annex VI, this Code addresses only those requirements applicable to an engine’s compliance with the NO<sub>x</sub> emission limits.

**Interpretation:**

For application of this section the term “installed” shall be interpreted as per IACS UI MPC

Nos. 14, 16, 17 & 18.

**Note:**

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC****32**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

**Chapter 1.3.2.2 / Chapter 1.3***Definitions*

Chapter 1.3.2.2 reads as follows:

For engines installed on ships constructed before 1 January 2000, substantial modification means any modification made to an engine which increases its existing emission characteristics established by the simplified measurement method as described in 6.3 in excess of the allowances set out in 6.3.11. These changes include, but are not limited to, changes in



its operations or in its technical parameters (e.g., changing camshafts, fuel injection systems, air systems, combustion chamber configuration, or timing calibration of the engine).

**Interpretation:**

For application of this section it shall be interpreted that an increase in "emission characteristics" relates to an increase in the application average cycle weighted NOx emission value. Furthermore it shall also be interpreted that any modification made on or after 1 January 2000 to such an engine involving alternative duty cycle, rating, components or settings that were available, but not necessarily utilised, prior to 1 January 2000 shall not be considered as representing a "substantial modification" to that engine.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC**

**33**

(July 2004)

(Rev.1

Mar 2006)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

**Chapter 2.2.4 / Chapter 2.2**

*Procedures for pre-certification of an Engine Group*

Chapter 2.2.4 reads as follows:

There are engines which, due to their size, construction and delivery schedule, cannot be precertified on a test-bed. In such cases, the engine manufacturer, shipowner or ship builder shall make application to the Administration requesting an on-board test (see 2.1.2.2). The applicant must demonstrate to the Administration that the on-board test fully meets all of the requirements of a test-bed procedure as specified in chapter 5 of this Code. Such a survey may be accepted for one engine or for an engine group represented by the parent engine only, but it shall not be accepted for an engine family certification. In no case shall an allowance be granted for possible deviations of measurements if an initial survey is carried on board a ship without any valid pre-certification test.

**Interpretation:**

For engines undergoing an on-board certification test, to be issued with an EIAPP Certificate, the same procedure apply as if the engine had been pre-certified on a test-bed:

- (a) the survey on-board meets the pre-certification survey requirements; and
  - (b) the on-board test fully meets all of the requirements of a test-bed procedure as specified in chapter 5 of the NOx Technical Code; and
  - (c) the application average weighted NOx emission value meets the requirements of Regulation 13 of Annex VI; and
  - (d) the engine has an approved Technical File.
- (MEPC/Circ. 473)

Note:

1. This UI is to be uniformly implemented by IACS Societies from 19 May 2005.
2. Revision 1 of this UI is to be uniformly implemented by IACS Societies from 1 July 2006.

**MPC**

**34**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

**Chapter 2.2.5 / Chapter 2.2**

*Procedures for pre-certification of an Engine Group*

Chapter 2.2.5 reads as follows:

If the pre-certification test results show that an engine fails to meet the NOx emission limits as required by regulation 13 of Annex VI, a NOx-reducing device may be installed. This device, when installed on the engine, must be recognised as an essential component of the engine and its presence will be recorded in the engine's technical file. To receive an EIAPP Certificate for this assembly, the engine, including the reducing device, as installed, must be re-tested to show compliance with the NOx emission limits. However, in this case, the assembly may be retested in accordance with the simplified measurement method addressed in 6.3. The NOx-reducing device shall be included on the EIAPP Certificate together with all other records requested by the Administration. The engine's technical file shall also contain on-board NOx verification procedures for the device to ensure it is operating correctly.

**Interpretation:**

This section shall be interpreted as follows:

- (a) An engine does not need to be shown, at the pre-certification survey, to fail to meet the Regulation 13 NOx emission limit requirements before a NOx reducing device is installed. Where it is intended from the outset that a NOx reducing device is to be fitted in accordance with Regulation 13(3)(b)(i) then the whole assembly shall be tested in accordance with

the requirements of the test bed procedure as specified in Chapter 5. In those cases where it is proposed that the engine with a NO<sub>x</sub>-reducing device is to be tested onboard to demonstrate compliance, as a 'Parent Engine + device' the requirements of 2.2.4 shall apply.

(b) Where the pre-certification test of an engine, undertaken in accordance with Chapter 5, shows that a NO<sub>x</sub> reducing device would need to be fitted in order to meet the Regulation 13 NO<sub>x</sub> emission limit requirements, and the whole assembly is subsequently retested in accordance with the simplified measurement method, the test reports from both the engine pre-certification test and the subsequent simplified measurement method test shall be included in the Technical File. Where the simplified measurement method is used to verify that the whole assembly meets the Regulation 13 NO<sub>x</sub> emission limit requirements the allowances as given under 6.3.11 shall not be granted.

(c) In cases (a) and (b) the approval is on the basis of the complete assembly of engine and NO<sub>x</sub> reduction device. Consequently Item 1.15 of the Supplement to EIAPP Certificate shall give the actual NO<sub>x</sub> emission value (g/kWh) for the engine with the NO<sub>x</sub> reduction device in operation.

(d) The efficiency of the NO<sub>x</sub>-reducing device (as demonstrated) shall be considered as unique to the Engine Group as tested and therefore non-transferable. Hence should the same NO<sub>x</sub> – reducing device be used for another Engine Group the whole assemblage (engine + NO<sub>x</sub> reducing device) shall be tested. An after-treatment device shall not be certified independent of the engine to which it is to be coupled.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

## MPC

### 35

(July 2004)

(Rev.1

Mar 2006)

#### **Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

##### **Chapter 2.2.8 / Chapter 2.2**

*Procedures for pre-certification of an Engine Group*

Chapter 2.2.8 reads as follows:

A flow chart providing guidance for compliance with the requirements of a pre-certification survey for marine diesel engines intended for installation on board of ships is provided in figure1 of appendix 2 of this Code.

##### **Interpretation:**

The text in chapter 2 gives the certification procedures which shall be followed. Where discrepancies exist with figure 1, the text of chapter 2 takes precedence.

(MEPC/Circ. 473)

Note:

1. This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

2. Revision 1 of this UI is to be uniformly implemented by IACS Societies from

1 July 2006.

## MPC

### 36

(July 2004)

#### **Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

##### **Chapter 2.2.9 / Chapter 2.2**

*Procedures for pre-certification of an Engine Group*

Chapter 2.2.9 reads as follows:

A model form of an EIAPP Certificate is attached as appendix 1 to this Code.

##### **Interpretation:**

The model form Supplement to Engine International Air Pollution Prevention Certificate particulars indicated below shall be interpreted as follows:

(a) 1.12 Specification(s) of test fuel

The particular ISO 8217 grade specification applicable to the fuel oil used at the relevant Parent Engine test (i.e. DMA, DMB, DMC) shall be given on all (Parent and Member Engine) EIAPP Certificates within that Engine Group / Engine Family.

(b) 1.14 Applicable NO<sub>x</sub> emission limit (g/kWh) (regulation 13 of Annex VI) The limit value given here shall be the limit value for the Engine Group / Engine Family based on the highest engine speed to be included in that Engine Group / Engine Family (in accordance with Regulation 13(3)(a)), irrespective of the rated speed of the Parent Engine or the rated speed of the particular engine as given on the EIAPP Certificate.

(c) 1.15 Engine's actual NO<sub>x</sub> emission value (g/kWh)

The appropriate application average weighted NO<sub>x</sub> emission value(s) determined at the Parent Engine test shall be given on all (Parent and Member Engine) EIAPP Certificates. In the case of an Engine Group / Engine Family which is approved to more than one application cycle the Parent Engine value shall, as a minimum, be given for the particular

application cycle applicable to the specific engine to which the EIAPP Certificate refers. In those cases where the Technical File includes tolerances in respect of NO<sub>x</sub> emission settings then the effect upon the as measured emission value of those tolerances shall be stated and the basis of the emission value, as stated under 1.15 of the EIAPP Certificate, be given. In no cases shall the effect tolerances be such as to exceed the limit value as stated under 1.14 of the EIAPP Certificate. Where the installation includes a NO<sub>x</sub>-reducing device the actual NO<sub>x</sub> emission value (g/kWh) for the engine with the NO<sub>x</sub> reduction device in operation shall be given.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

## MPC

37

(July 2004)

### **Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

#### **Chapter 2.3.4 / Chapter 2.3**

*Procedures for certification of an engine*

Chapter 2.3.4 reads as follows:

The shipowner shall have the option of direct measurement of NO<sub>x</sub> emissions during engine operation. Such data may take the form of spot checks logged with other engine operating data on a regular basis and over the full range of engine operation or may result from continuous monitoring and data storage. Data must be current (taken within the last 30 days) and must have been acquired using the test procedures cited in this NO<sub>x</sub> Technical Code. These monitoring records shall be kept on board for three months for verification purposes by the Parties to the Protocol of 1997. Data shall also be corrected for ambient conditions and fuel specification, and measuring equipment must be checked for correct calibration and operation, in accordance with the procedures specified by the measurement equipment manufacturer in the engine's technical file. Where exhaust gas after-treatment devices are fitted which influence the NO<sub>x</sub> emissions, the measuring point(s) must be located downstream of such devices.

#### **Interpretation:**

For application of this section it shall be interpreted that any system or procedure utilised to monitor engine NO<sub>x</sub> emissions by the direct measurement method shall meet the requirements of MEPC Resolution 103(49) 'Guidelines for On-board NO<sub>x</sub> Verification Procedure – Direct Measurement and Monitoring Method'.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

## MPC

38

(July 2004)

### **Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

#### **Chapter 2.3.5 / Chapter 2.3**

*Procedures for certification of an engine*

Chapter 2.3.5 reads as follows:

To demonstrate compliance by the direct measurement method, sufficient data shall be collected to calculate the weighted average NO<sub>x</sub> emissions in accordance with this Code.

#### **Interpretation:**

For application of this section it shall be interpreted that sufficient data shall be collected by the direct measurement method to enable the weighted average NO<sub>x</sub> emissions to be determined in accordance with MEPC Resolution 103(49) 'Guidelines for On-board NO<sub>x</sub> Verification Procedure – Direct Measurement and Monitoring Method'.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

## MPC

39

(July 2004)

(Rev.1

Mar 2006)

### **Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

#### **Chapter 2.3.6 / Chapter 2.3**

*Procedures for certification of an engine*

Chapter 2.3.6 reads as follows:

Every marine diesel engine installed on board a ship shall be provided with a technical file. The technical file shall be prepared by the engine manufacturer and approved by the Administration, and required to accompany an engine throughout its life on board ships. The technical file shall contain information as specified in 2.4.1.

**Interpretation:**

For application of this section it shall be interpreted that the term “engine manufacturer” is the entity which applied for the engine certification.

(MEPC/Circ. 473)

Note:

1. This UI is to be uniformly implemented by IACS Societies from 19 May 2005.
2. Revision 1 of this UI is to be uniformly implemented by IACS Societies from 1 July 2006.

**MPC**

**40**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

**Chapter 2.3.11 / Chapter 2.3**

*Procedures for certification of an engine*

Chapter 2.3.11 reads as follows:

If any adjustment or modification is made which is outside the approved limits documented in the technical file, the IAPP Certificate may be issued only if the overall NOx emission performance is verified to be within the required limits by: a direct on-board NOx monitoring, as approved by the Administration; a simplified on-board NOx measurement; or, reference to the test-bed testing for the relevant engine group approval showing that the adjustments or modifications do not exceed the NOx emission limits.

**Interpretation:**

This section shall be interpreted as follows:

- (a) Verification by the direct on-board NOx monitoring method is only applicable to the reissue of IAPP Certificates at periodical surveys or their endorsement at intermediate / annual surveys.
- (b) The demonstration of compliance in accordance with either direct on-board NOx monitoring or simplified on-board NOx measurement does not establish a new Engine Group but does define the on-board verification procedure to be used thereafter to verify continuing compliance for that particular engine. In these instances it shall be understood that the Parent Engine emission value, as given in the EIAPP Certificate, thereafter only relates to the condition of that engine at the Precertification Survey stage.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC**

**41**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

**Chapter 2.3.12 / Chapter 2.3**

*Procedures for certification of an engine*

Chapter 2.3.12 reads as follows:

The Administration may, at its own discretion, abbreviate or reduce all parts of the survey on board, in accordance with this Code, to an engine which has been issued an EIAPP Certificate. However, the entire survey on board must be completed for at least one cylinder and/or one engine in an engine family or engine group, or spare part, if applicable, and the abbreviation may be made only if all the other cylinders and/or engines or spare parts are expected to perform in the same manner as the surveyed engine and/or cylinder or spare part.

**Interpretation:**

For application of this section it shall be interpreted that a physical verification must be completed prior to the issue or endorsement of an IAPP Certificate. This verification may be completed on a spare part representative of the working component (at the Administration’s discretion) but such a component must be suitably defined in the Technical File on-board NOx verification procedures.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC**

**42**

(July 2004)

(Rev.1  
Mar 2006)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

**Chapter 2.3.13 / Chapter 2.3**

*Procedures for certification of an engine*

Chapter 2.3.13 reads as follows:

Flow charts providing guidance for compliance with the requirements of an initial, periodical and intermediate surveys for certification of marine diesel engines installed on board ships are provided in figures 2 and 3 of appendix 2 of this Code.

**Interpretation:**

This section shall be interpreted as follows:

The text in chapter 2 gives the certification procedures which shall be followed. Where discrepancies exists with figure 2 and 3, the text of chapter 2 takes precedence.

(MEPC/Circ. 473)

Note:

1. This UI is to be uniformly implemented by IACS Societies from 19 May 2005.
2. Revision 1 of this UI is to be uniformly implemented by IACS Societies from 1 July 2006.

**MPC**

**43**

(July 2004)

(Rev.1

Mar 2006)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

**Chapter 2.4.1.1 / Chapter 2.4**

*Technical file and on-board NOx verification procedures*

Chapter 2.4.1.1 reads as follows:

To enable an Administration to perform the engine surveys described in 2.1, the technical file required by 2.3.6 shall, at a minimum, contain the identification of those components, settings and operating values of the engine which influences its NOx emissions.

**Interpretation:**

This section shall be interpreted as follows:

Where a NOx reducing device or system is fitted in order to achieve compliance with regulation 13 (in accordance with paragraph 2.2.5), these shall be identified in the Technical File.

(MEPC/Circ. 473)

Note:

1. This UI is to be uniformly implemented by IACS Societies from 19 May 2005.
2. Revision 1 of this UI is to be uniformly implemented by IACS Societies from 1 July 2006.

**MPC**

**44**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

**Chapter 2.4.1.5 / Chapter 2.4**

*Technical file and on-board NOx verification procedures*

Chapter 2.4.1.5 reads as follows:

To enable an Administration to perform the engine surveys described in 2.1, the technical file required by 2.3.6 shall, at a minimum, contain a copy of the test report required in 5.10.

**Interpretation:**

For application of this section it shall be interpreted that:

- (a) The copy of the test report to be included in the Technical File of every engine shall provide, as a minimum, the data necessary to verify the relevant Parent Engine's actual NOx emission value as detailed under item 1.15 of the EIAPP Certificate; and,
- (b) In those cases where the Engine Group / Engine Family is certified for more than one application cycle the Technical File is to include, as a minimum, the Parent Engine Test report(s) for those duty cycles for which the particular engine is certified – as given on the engine's EIAPP Certificate and detailed under items 1.9, 1.14 and 1.15 of the Supplement to the EIAPP Certificate.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC****45**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines****Chapter 2.4.1.7 / Chapter 2.4**

*Technical file and on-board NOx verification procedures*

Chapter 2.4.1.7 reads as follows:

To enable an Administration to perform the engine surveys described in 2.1, the technical file required by 2.3.6 shall, at a minimum, contain the specifications of those spare parts/components which, when used in the engine, according to those specifications, will result in continued compliance of the engine with the NOx emission limits.

**Interpretation:**

For application of this section the term "according to those specifications" shall be interpreted as follows:

(a) It is considered that in this context "specification" may be read as identification marking and as such the identification of a NOx influencing component by a manufacturer's part number or specific marking scheme would be sufficient.

In such instances the identification marking would be tied to a particular drawing or other data defining the features of that component with regard to its influence on NOx formation in the combustion process. Those drawings or other data shall form part of the conformity of production procedures as required under Chapter 4.

(b) The "specification" need only address those aspects of the design of the component which directly affect its function as a NOx critical component. For some components it may be possible to define these components by means of an outline dimensioned drawing within the conformity of production procedures or as a drawing directly included within the Technical File.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC****46**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines****Chapter 2.4.2 / Chapter 2.4**

*Technical file and on-board NOx verification procedures*

Chapter 2.4.2 reads as follows:

To ensure that engines are in compliance with regulation 13 of Annex VI after installation, each engine with an EIAPP Certificate shall be checked at least once prior to issuance of the IAPP Certificate. Such check can be done using the on-board NOx verification procedures specified in the engine's technical file or one of the other methods if the owner's representative does not wish to check using the on-board NOx verification procedures.

**Interpretation:**

For application of this section it shall be interpreted that, prior to the issuance of an IAPP Certificate, compliance after installation can only be verified by using an on-board NOx verification procedure approved by the Administration for that particular engine.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC****47**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines****Chapter 2.4.4.3 / Chapter 2.4**

*Technical file and on-board NOx verification procedures*

Chapter 2.4.4.3 reads as follows:

On-board NOx verification procedures shall be determined by using the direct measurement and monitoring method in accordance with 2.3.4, 2.3.5, 2.3.7, 2.3.8, 2.3.11, and 5.5.

**Interpretation:**

For application of this section it shall be interpreted that the on-board NOx verification procedures have been approved by the Administration taking into account MEPC Resolution 103(49) the 'Guidelines for On-board NOx Verification Procedure – Direct Measurement and Monitoring Method'.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC****48**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines****Chapter 2.4.5 / Chapter 2.4**

*Technical file and on-board NOx verification procedures*

Chapter 2.4.5 reads as follows: When a NOx monitoring and recording device is specified as on-board NOx verification procedures, such device shall be approved by the Administration based on guidelines to be developed by the Organization. These guidelines shall include, but are not limited to, the following items:

1. a definition of continuous NOx monitoring, taking into account both steady-state and transitional operations of the engine;
2. data recording, processing and retention;
3. a specification for the equipment to ensure that its reliability is maintained during service;
4. a specification for environmental testing of the device;
5. a specification for the testing of the equipment to demonstrate that it has a suitable accuracy, repeatability and cross sensitivity compared with the applicable sections of this Code; and
6. the form of the approval certificate to be issued by the Administration.

**Interpretation:**

For application of this section it shall be interpreted that MEPC Resolution 103(49) 'Guidelines for On-board NOx Verification Procedure – Direct Measurement and Monitoring Method' defines the guidelines as developed by the Organization.

**Note:**

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC****49**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines****Chapter 3.1.1 / Chapter 3.1**

*Maximum allowable NOx emission limits for marine diesel engines*

Chapter 3.1.1 reads as follows:

The graph in figure 1 represents the maximum allowable NOx emission limit values based on the formulae included in paragraph 3(a) of regulation 13 of Annex VI. The total weighted NOx emissions, as measured and calculated in accordance with the procedures in this Code, shall be equal to or less than the applicable value from the graph corresponding to the rated speed of the engine.

**Interpretation:**

For application of this section (in accordance with the Unified Interpretation of Regulation 13 (3) (a)) that precision to one decimal place shall be applied when comparing the determined final weighted NOx values (g/kWh) with the applicable limit determined in accordance with the formulae given under paragraph 3(a) of regulation 13 of Annex VI.

**Note:**

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC****50**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines****Chapter 3.1.3 / Chapter 3.1**

*Maximum allowable NOx emission limits for marine diesel engines*

Chapter 3.1.3 reads as follows:

An engine's applicable exhaust emissions limit value from figure 1 and the actual calculated exhaust emissions value for the engine shall be stated on the engine's EIAPP Certificate.

**Interpretation:**

For application of this section it shall be interpreted (in accordance with the Unified Interpretation of Regulation 13 (3) (a)) that the limit and determined NOx values in g/kWh stated on the EIAPP Certificate shall be given to the first decimal place. Furthermore (in accordance with the Unified Interpretation of Chapter 2.2.9) it is the relevant application cycle(s) Parent Engine value(s) which must be stated on the engine's EIAPP Certificate.

**Note:**

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC****51**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines****Chapter 3.2.1 / Chapter 3.2***Test cycles and weighting factors to be applied*

Chapter 3.2.1 reads as follows:

For every individual engine or parent engine of an engine group or family, one of the test cycles specified in 3.2.2 to 3.2.6 shall be applied for verification of compliance with the NOx emission limits in accordance with regulation 13 of Annex VI.

**Interpretation:**

For application of this section it shall be interpreted that:

- (a) One of the test cycles specified in Chapters 3.2.2 to 3.2.6, applicable to the application, shall be applied.
- (b) Where more than one test cycle is to be applied the average cycle weighted NOx emission value (in g/kWh) for each cycle is to be stated on the EIAPP Certificate 1.15, together with the corresponding limit value, 1.14.
- (c) A Parent Engine test for a particular duty cycle is to follow the appropriate test cycle. A Parent Engine emission value shall not be 'constructed' by, for example, adding data from one test to emission values taken from another test.
- (d) In those instances where a constant speed engine as installed can be used either solely for main propulsion or auxiliary purposes, then that engine should be certified to both the E2 and D2 cycles.
- (e) Where a generator is also permanently fitted or coupled to main engine propulsion shafting then certification of that main engine using only the E2 or E3 cycle, as appropriate, is required.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC****52**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines****Chapter 3.2.3 / Chapter 3.2***Test cycles and weighting factors to be applied*

Chapter 3.2.3 reads as follows:

For variable-pitch propeller sets, test cycle E2 shall be applied in accordance with table 1. Table 1 – Test cycle for "Constant-speed main propulsion" application (including diesel-electric drive and variable-pitch propeller installations)

Test cycle type E2	Speed	100%	100%	100%	100%
	Power	100%	75%	50%	25%
	Weighting factor	0.2	0.5	0.15	0.15

**Interpretation:**

For application of the term "variable-pitch propeller sets" it shall be interpreted that the E2 cycle is applicable to any propulsion engine coupled to a variable pitch propeller, irrespective of whether the system operates at constant speed or variable speeds.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC****53**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines****Chapter 4.1.1 / Chapter 4.1.2 / Chapter 4.1.3 / Chapter 4.1.4 / Chapter 4***Approval for serially manufactured engines: engine family and engine group concepts***Chapter 4.1***General*



Chapter 4.1.1 reads as follows:

To avoid certification testing of every engine for compliance with the NO<sub>x</sub> emission limits, one of two approval concepts may be adopted, namely the engine family or the engine group concept.

Chapter 4.1.2 reads as follows:

The engine family concept may be applied to any series-produced engines which, through their design, are proven to have similar NO<sub>x</sub> emission characteristics, are used as produced, and, during installation on board, require no adjustments or modifications which could adversely affect the NO<sub>x</sub> emissions.

Chapter 4.1.3 reads as follows:

The engine group concept may be applied to a smaller series of engines produced for similar engine application and which require minor adjustments and modifications during installation or in service on board. These engines are normally large power engines for main propulsion.

Chapter 4.1.4 reads as follows:

Initially the engine manufacturer may, at its discretion, determine whether engines should be covered by the engine family or engine group concept. In general, the type of application shall be based on whether the engines will be modified, and to what extent, after testing on a testbed.

**Interpretation:**

The Engine Family concept shall be interpreted as applicable to mass produced small bore engines (generally high speed) that may, for design purposes, include adjustable features but are generally dispatched with the intent that no 'installation' or 'in service' setting modifications are undertaken. For marine engine applications the Engine Group concept shall be interpreted as applicable to any engine intended for main propulsion or auxiliary duties, where adjustment and modification following installation (and through the service life of the engine) is considered routine. For application of the Engine Family or Engine Group concepts it shall be interpreted that engines within an Engine Family may have different cylinder bore and stroke dimensions (within the defined limits - see Chapter 4.3.8.2.3) and that engines within an Engine Group concept effectively have identical bore and stroke dimensions as a result of only one of the parameters defined under Chapter 4.4.5.2 being permitted to vary within the defined engine group. An Onboard NO<sub>x</sub> Verification Procedure shall be included within the Technical Files of all engines irrespective of whether they are included within an Engine Family or Engine Group.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC**

**54**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

**Chapter 4.3.1 / Chapter 4.4.1 / Chapter 4.3**

*Application of the engine family concept*

Chapter 4.3.1 reads as follows:

The engine family concept provides the possibility of reducing the number of engines which must be submitted for approval testing, while providing safeguards that all engines within the family comply with the approval requirements. In the engine family concept, engines with similar emission characteristics and design are represented by a parent engine within the family.

**Chapter 4.4 Application of the engine group concept**

Chapter 4.4.1 reads as follows:

These are engines used primarily for main propulsion. They normally require adjustment or modification to suit the on-board operating conditions but which should not result in NO<sub>x</sub> emissions exceeding the limits in 3.1 of this Code.

**Interpretation:**

For application of these sections it shall be interpreted that where the measured performance of a Member Engine to an Engine Family or Engine Group is fundamental to the verification that that member engine is operating within the parameters defined by the approved engine family or group, then that performance data (emissions, engine performance, ambient conditions) and other necessary data shall have been obtained in accordance with NO<sub>x</sub> Technical Code Chapter 5.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC**

**55**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

**Chapter 4.3.7 / Chapter 4.3.10.6 / Chapter 4.4.8 / Chapter 4.3**

*Application of the engine family concept*

Chapter 4.3.7 reads as follows:

Before granting an engine family approval, the Administration shall take the necessary measures to verify that adequate arrangements have been made to ensure effective control of the conformity of production.

#### **Chapter 4.3.10**

*Certification of an engine family*

#### **Chapter 4.3.10**

*Certification of an engine family*

Chapter 4.3.10.6 reads as follows:

Before granting an engine family approval for new, serially produced engines, the Administration shall take the necessary measures to verify that adequate arrangements have been made to ensure effective control of the conformity of production. This requirement may not be necessary for families established for the purpose of engine modifications on board after an EIAPP Certificate has been issued.

#### **Chapter 4.4**

*Certification of an engine group*

#### **Chapter 4.4.8**

*Certification of an engine group*

Chapter 4.4.8 reads as follows:

The requirements of 4.3.10 apply mutatis mutandis to this section.

#### **Interpretation:**

For application of these sections it shall be interpreted that the conformity of production scheme would need to demonstrate the following aspects:

- (a) The connection between the NOx critical component part / ID numbers as proposed for the Engine Family or Engine Group and the drawing numbers (and revision status if applicable) defining those components.
- (b) The means by which the Administration will be able, at the time of a survey, to verify that the drawings used for the production of the NOx critical components correspond to the drawings established as defining the Engine Family or Engine Group.
- (c) Drawing revision control arrangements. Where it is proposed by a manufacturer that revisions to the NOx critical component drawings defining an Engine Family or Engine Group may be undertaken through the life of an engine, then the conformity of production scheme would need to demonstrate the procedures to be adopted to cover the cases where revisions (a) will not, or (b) may affect NOx emissions. These procedures shall cover drawing number allocation, effect on the identification markings on the NOx critical components and the provision for providing the revised drawings to the Administration responsible for the original Engine Family or Engine Group approval. Where these revisions may affect the NOx emissions the means to be adopted to assess / verify performance against the parent engine performance are to be stated together with the subsequent actions to be taken regarding advising the Administration and, where necessary, the declaration of a new Parent Engine prior to the introduction of those modifications into service.
- (d) The implemented procedures that ensure any NOx critical component spare parts supplied to a certified engine will be identified as given in the approved Technical File and hence will be produced in accordance with the drawings as defining the Engine Family or Engine Group. It would also be interpreted that all items (a) – (d) are applicable to Engine Family, EngineGroup and single engines.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

## **MPC**

### **56**

(July 2004)

## **Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

### **Chapter 4.3.9.1 / Chapter 4.4.7**

#### **Chapter 4.3**

*Application of the engine family concept*

#### **Chapter 4.3.9**

*Guidelines for selecting the parent engine of an engine family*

Chapter 4.3.9.1 reads as follows:

The method of selection of the parent engine for NOx measurement shall be agreed to and approved by the Administration. The method shall be based upon selecting an engine which incorporates engine features and characteristics which, from experience, are known to produce the highest NOx emissions expressed in grams per kilowatt hour (g/kWh). This requires detailed knowledge of the engines within the family. Under certain circumstances, the Administration may conclude that the worst case NOx emission rate of the family can best be characterised by testing a second engine. Thus, the Administration may select an additional engine for test based upon features which indicate that it may have the highest NOx emission levels of the engines within that family. If engines within the family incorporate other variable features which could be considered to affect NOx emissions, these features must also be identified and taken into account in the selection of the parent engine.

#### **Chapter 4.4.7**

*Guidelines for the selection of the parent engine of an engine group*

Chapter 4.4.7 reads as follows:

The selection of the parent engine shall be in accordance with the criteria in 4.3.9, as applicable. It is not always possible to select a parent engine from small-volume production engines in the same way as the mass-produced engines (engine family). The first engine ordered may be registered as the parent engine. The method used to select the parent engine to represent the engine group shall be agreed to and approved by the Administration.

**Interpretation:**

For application of these sections it shall be interpreted that where a Parent Engine (e.g. large bore 2-stroke engine) cannot be adjusted (e.g. maximum pressure, compression pressure, exhaust back pressure, charge air temperature) to the defined reference or maximum tolerance conditions at the test bed the measured NOx emission values shall be corrected to the defined reference and maximum tolerance conditions on the basis of sensitivity tests. This correction shall be approved by the Administration. The resulting corrected average weighted NOx emission value is to be stated under 1.15 of the EIAPP Certificate.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC**

**57**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

**Chapter 4.3.9.2**

**Chapter 4.3**

*Application of the engine family concept*

**Chapter 4.3.9**

*Guidelines for selecting the parent engine of an engine family*

Chapter 4.3.9.2 reads as follows:

The following criteria for selecting the parent engine for NOx emission control shall be considered, but the selection process must take into account the combination of basic characteristics in the engine specification:

1. main selection criteria
  - higher fuel delivery rate
2. supplementary selection criteria
  - higher mean effective pressure
  - higher maximum cylinder peak pressure
  - higher charge air/ignition pressure ratio
  - dp/d<sub>c</sub>, the lower slope of the combustion curve
  - higher charge air pressure
  - higher charge air temperature

**Interpretation:**

For application of this section the term "main selection criteria" shall be interpreted as a possible selection criterion if no knowledge about the emission behavior of an Engine Family or Engine Group is available. In all cases the final selection criteria for the Parent Engine is the highest resulting average weighted NOx emission, at the applicable test cycle, according to section 4.3.9.1.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC**

**58**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

**Chapter 4.3.10.2 / Chapter 4.3.10.3**

**Chapter 4.3**

*Application of the engine family concept*

**Chapter 4.3.10**

*Certification of an engine family*

Chapter 4.3.10.2 reads as follows:

A pre-certificate, or EIAPP Certificate, should be issued for a member engine of an entire family in accordance with this Code which certifies that the parent engine meets the NOx levels specified in regulation 13 of Annex VI.

Chapter 4.3.10.3 reads as follows:

When the parent engine of an engine family is tested/measured under the most adverse conditions specified within this Code and confirmed as complying with the maximum allowable emission limits (see 3.1), the results of the test and NOx measurement shall be recorded in the EIAPP Certificate issued for the particular parent engine and for all member engines of the engine family.

**Interpretation:**

In 4.3.10.2 the word 'entire' shall be read as 'engine'. For application of these sections it shall be interpreted that the determined Parent Engine NOx emission value shall be given under 1.15 of the Supplement to EIAPP Certificate for Parent Engine(s) and all subsequent Member Engines within the Engine Family or Engine Group as established from that Parent Engine test.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

## MPC

### 59

(July 2004)

#### **Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

##### **Chapter 4.4.5.2 / Chapter 4.4.5.3**

### **Chapter 4.4**

*Application of the engine group concept*

#### **Chapter 4.4.5**

*Guidelines for the selection of an engine group*

Chapter 4.4.5.2 reads as follows:

The following parameters and specifications must be common to engines within an engine group:

1. bore and stroke dimensions;
2. method and design features of pressure charging and exhaust gas system;
  - constant pressure
  - pulsating system
3. method of charge air cooling system;
  - with/without charge air cooler
4. design features of the combustion chamber that effect NOx emission;
5. design features of the fuel injection system, plunger and injection cam which may profile basic characteristics that effect NOx emission; and
6. maximum rated power per cylinder at maximum rated speed. The permitted range of derating within the engine group shall be declared by the manufacturer and approved by the Administration.

Chapter 4.4.5.3 reads as follows:

Generally, if the parameters required by 4.4.5.2 are not common to all engines within a prospective engine group, then those engines may not be considered as an engine group. However, an engine group may be accepted if only one of those parameters or specifications is not common for all of the engines within a prospective engine group provided the engine manufacturer or the shipowner can, within the technical file, prove to the Administration that such a transgression of that one parameter or specification would still result in all engines within the engine group complying with the NOx emission limits.

#### **Interpretation:**

For application of these sections it shall be interpreted that rated power per cylinder at rated speed is one parameter. Derating and uprating, in terms of power per cylinder and rated speed, outside the approved power or speed ranges shall be interpreted as deviations according to chapter 4.4.5.3.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

## MPC

### 60

(July 2004)

#### **Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

##### **Chapter 5.2.2.2**

#### **Chapter 5.2**

*Test conditions*

Chapter 5.2.2.2 reads as follows:

All engines when equipped as intended for installation on board ships must be capable of operating within the allowable NOx emission levels of regulation 13 (3) of Annex VI at an ambient seawater temperature of 25OC.\*

\* 25OC seawater temperature is the reference ambient condition to comply with the NOx limits. An additional temperature increase due to heat exchangers installed on board, e.g., for the lowtemperature cooling water system, shall be taken into consideration.

#### **Interpretation:**

For application of this section it shall be interpreted that the 25OC seawater temperature defines an ambient reference value for which compliance with the NOx emission limits as defined by regulation 13 (3) must be demonstrated (tested or calculated with TSC Ref specified by the manufacturer). The application of this reference primary coolant value shall be considered in accordance with the charge air cooling arrangement applicable to the individual installation as follows:

(a) Direct seawater cooling to engine charge air coolers. Compliance with the NO<sub>x</sub> limits shall be demonstrated (or otherwise justified) with a charge air / scavenge air cooler coolant inlet temperature of 25OC.

(b) Intermediate 'freshwater' cooling to engine charge air coolers. Compliance with the NO<sub>x</sub> limits shall be demonstrated (or otherwise justified) with the charge air / scavenge air cooling system operating with the highest allowable in service coolant inlet temperature regime comparable with an ambient seawater temperature of 25OC. Demonstration of compliance at a Parent Engine test for a direct seawater cooled system, as given by (a) above, does not demonstrate compliance in accordance with the higher charge air temperature regime inherent with an intermediate 'freshwater' cooling arrangement as given under (b).

(c) For those installations incorporating no seawater cooling, either direct or indirect, to the charge air coolers e.g. radiator cooled 'freshwater' systems, air / air charge air coolers, then it shall be interpreted that compliance with the NO<sub>x</sub> limits must be demonstrated with the engine and charge air cooling systems operating "as intended for installation on board".

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

## MPC

### 61

(July 2004)

#### **Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

##### **Chapter 5.2.5**

##### **Chapter 5.2**

*Test conditions*

##### **Chapter 5.2.5**

*Engine exhaust system*

Chapter 5.2.5 reads as follows:

The test engine shall be equipped with an exhaust system which provides an exhaust backpressure as specified by the manufacturer at the engine operating conditions and which results in the maximum declared power in the respective engine application.

##### **Interpretation:**

Where test bed installation prevents adjustment to the exhaust backpressure limit the effect upon the NO<sub>x</sub> emissions shall be stated and justified by the manufacturer.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

## MPC

### 62

(July 2004)

(Rev.1

Mar 2006)

#### **Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

##### **Chapter 5.4.2**

##### **Chapter 5.4**

*Measurement equipment*

Chapter 5.4.2 reads as follows:

Other systems or analysers may, subject to the approval of the Administration, be accepted if they yield equivalent results to that of the equipment referenced in 5.4.1.

##### **Interpretation:**

For application of the term "equivalent" it shall be interpreted that alternative systems or analysers would, as quantified by using recognized national or international standards (such as ISO 8178, Part 1:1996, section 7), yield equivalent results when used to measure diesel engine exhaust emission concentrations in terms of the requirements referenced in 5.4.1.

(MEPC/Circ. 473)

Note:

1. This UI is to be uniformly implemented by IACS Societies from 19 May 2005.
2. Revision 1 of this UI is to be uniformly implemented by IACS Societies from 1 July 2006.

## MPC

### 63

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

**Chapter 5.5.3**

**Chapter 55.**

*Determination of exhaust gas flow*

**Chapter 5.5.3**

*Carbon-balance method*

Chapter 5.5.3 reads as follows:

This method involves exhaust gas mass flow calculation from fuel consumption and exhaust gas concentrations using the carbon and oxygen balance method as specified in appendix 6 of this Code.

**Interpretation:**

For calculation of the exhaust gas mass flow in accordance with "Method 2, universal, carbon/oxygen-balance" detailed under appendix 6 the "CW (soot)" term shall be taken as zero.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC**

**64**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

**Chapter 5.6**

*Permissible deviations of instruments for engine-related parameters and other essential parameters*

Chapter 5.6 reads as follows:

The calibration of all measuring instruments shall be traceable to recognised international standards and shall comply with the requirements as set out in 1.3.1 of appendix 4 of this Code.

**Interpretation:**

For application of this section it shall be interpreted that the measuring instruments as detailed under Appendix 4 is not to be considered a definitive listing. Where additional measuring instruments are required in order to define an engine's NOx emission performance, for example the measurement of peak cylinder or charge air pressures, then those measuring instruments shall also be calibrated. As given by 1.3.1 of Appendix 4 the recognised standards may be national or international.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC**

**65**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

**Chapter 5.9.1.2**

**Chapter 5.9**

*Test Run*

**Chapter 5.9.1**

*General*

Chapter 5.9.1.2 reads as follows:

The settings of inlet restriction and exhaust backpressure shall be adjusted to the upper limits as specified by the manufacturer in accordance with 5.2.4 and 5.2.5, respectively.

**Interpretation:**

Application of the term "upper limits" shall be interpreted as follows:

- (a) Inlet restriction – an air inlet restriction representative of an unfouled air cleaner.
- (b) Exhaust backpressure – where test bed installation prevents adjustment to the exhaust backpressure limit the effect upon the NOx emissions shall be stated and justified by the manufacturer.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC**

**66**

(July 2004)

(Rev.1  
Mar 2006)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

**Chapter 5.9.2**

**Chapter 5.9**

*Test Run*

**Chapter 5.9.2**

*Main exhaust components to be analysed*

Chapter 5.9.2.1 reads as follows:

An analytical system for the determination of the gaseous emissions (CO, CO<sub>2</sub>, HC, NO<sub>x</sub>, O<sub>2</sub>) in the raw exhaust gas shall be based on the use of the following analysers:

1. HFID analyser for the measurement of hydrocarbons;
2. NDIR analyser for the measurement of carbon monoxide and carbon dioxide;
3. HCLD or equivalent analyser for the measurement of nitrogen oxides; and
4. PMD, ECS or ZRDO for the measurement of oxygen.

**Interpretation:**

For application of 5.9.2.1.3 the term "equivalent" shall be interpreted as referring to the use of CLD analysers for the dry basis measurement of nitrogen oxides.

(MEPC/Circ. 473)

Note:

1. This UI is to be uniformly implemented by IACS Societies from 19 May 2005.
2. Revision 1 of this UI is to be uniformly implemented by IACS Societies from 1 July 2006.

**MPC**

**67**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

**Chapter 5.9.2.3**

**Chapter 5.9**

*Test Run*

Chapter 5.9.2.3 reads as follows:

Specifications and calibration of these analysers shall be as set out in appendices 3 and 4 of this Code, respectively.

**Interpretation:**

For application of this section it shall be interpreted that under Appendix 3 'Chapter 3 Analysers', in accordance with 5.9.2.1, the measurement of hydrocarbons (HC), in terms of ppmC<sub>1</sub>, must be undertaken using an analyser of the Heated Flame Ionisation (HFID) type. Gas shall be sampled, and maintained, at a temperature of 463 K (190°C)+10 K. The calibration, span check and other requirements of Appendix 4 shall also apply to the HC analyser for which a suitable hydrocarbon (for example, CH<sub>4</sub> or C<sub>3</sub>H<sub>8</sub> in air) calibration and span check gas is to be used.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC**

**68**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

**Chapter 5.9.3.1**

**Chapter 5.9**

*Test Run*

**Chapter 5.9.3**

*Sampling for gaseous emissions*

Chapter 5.9.3.1 reads as follows:

The sampling probes for the gaseous emissions shall be fitted at least 0.5m or 3 times the diameter of the exhaust pipe – whichever is the larger – upstream of the exit of the exhaust gas system, as far as practicable, but sufficiently close to the engine so as to ensure an exhaust gas temperature of at least 343K (70°C) at the probe.

**Interpretation:**

Recognising that successful measurement of gaseous HC requires an exhaust gas temperature of at least 190°C, the 70°C requirement shall be interpreted as a minimum exhaust gas temperature requirement at the NO<sub>x</sub> sampling probe

where that differs from the HC sampling probe. In the latter case a minimum temperature of 463 K (190oC) at the probe is required. With regard to the HC sampling system, a heated filter and sampling line shall be provided between the sampling probe and the HC analyser. The filter shall extract any solid particles from the gas sample before the analyser and be changed as necessary. The temperature of the heated filter and the wall temperature of the heated line shall be 463 K (190oC)  $\pm$  10 K.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

## MPC

### 69

(July 2004)

#### **Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

##### **Chapter 5.9.3.2**

### **Chapter 5.9**

*Test Run*

#### **Chapter 5.9.3**

*Sampling for gaseous emissions*

Chapter 5.9.3.2 reads as follows:

In the case of a multi-cylinder engine with a branched exhaust manifold, the inlet of the probe shall be located sufficiently far downstream so as to ensure that the sample is representative of the average exhaust emission from all cylinders. In multi-cylinder engines having distinct groups of manifolds, such as in a "Vee" engine configuration, it is permissible to acquire a sample from each group individually and calculate an average exhaust emission. Other methods which have been shown to correlate with the above methods may be used. For exhaust emission calculation, the total exhaust mass flow must be used.

#### **Interpretation:**

In the case of multiple turbocharger arrangements it shall be interpreted that where it is not possible to sample the exhaust gas from a position after where the individual turbochargertailpipes have combined into a single duct then the exhaust gas must be sampled downstream of each turbocharger and analysed. The individual measurement readings shall be averaged as necessary to provide the emission concentrations which are representative of the emissions from all cylinders.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

## MPC

### 70

(July 2004)

#### **Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

##### **Chapter 5.9.6.1**

### **Chapter 5.9**

*Test Run*

#### **Chapter 5.9.6**

*Test sequence*

Chapter 5.9.6.1 reads as follows:

After the procedures in 5.9.1 to 5.9.5 have been completed, the test sequence shall be started. The engine shall be operated in each mode in accordance with the appropriate test cycles defined in 3.2.

#### **Interpretation:**

For application of the term "test sequence" it shall be interpreted that the test cycle may be run from full power to low power, in accordance with the test cycles defined by 3.2, or from low to full power. In both instances sufficient time shall be given at each mode point for the engine performance (as indicated by the gaseous emission and engine performance readings) to stabilise.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

## MPC

### 71

(July 2004)

#### **Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of**



## Nitrogen Oxides from Marine Diesel Engines

### Chapter 5.9.6.2

#### Chapter 5.9

*Test Run*

#### Chapter 5.9.6

*Test sequence*

Chapter 5.9.6.2 reads as follows:

During each mode of the test cycle after the initial transition period, the specified speed shall be held within  $\pm 1\%$  of rated speed or 3 min<sup>-1</sup>, whichever is greater, except for low idle, which shall be within the tolerances declared by the manufacturer. The specific torque shall be held so that the average, over the period during which the measurements are to be taken, is within 2% of the maximum torque at the test speed.

#### **Interpretation:**

For application of the term "within 2% of the maximum torque" it shall be interpreted that in order to be consistent between the constant (D2 and E2) and the variable speed (C1 and E3) test cycles the specific torque at each load shall be held within 2% of the maximum (rated) torque at the engine's rated speed.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

## MPC

### 72

(July 2004)

(Rev.1

Mar 2006)

## **Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

### Chapter 5.9.7

#### Chapter 5.9

*Test Run*

#### Chapter 5.9.7

*Analyser response*

Chapter 5.9.7 reads as follows:

The output of the analysers shall be recorded, both during the test and during all response checks (zero and span), on a strip chart recorder or measured with an equivalent data acquisition system with the exhaust gas flowing through the analysers at least during the last ten minutes of each mode.

#### **Interpretation:**

For application of this section it shall be interpreted that the response must be of sufficient accuracy and resolution to enable verification of the zero and span response of the analysers in accordance with 5.9.9.

(MEPC/Circ. 473)

Note:

1. This UI is to be uniformly implemented by IACS Societies from 19 May 2005.
2. Revision 1 of this UI is to be uniformly implemented by IACS Societies from 1 July 2006.

## MPC

### 73

(July 2004)

## **Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

### Chapter 5.9.9

#### Chapter 5.9

*Test Run*

#### Chapter 5.9.9

*Re-checking the analysers*

Chapter 5.9.9 reads as follows:

After the emission test, the calibration of the analysers shall be re-checked, using a zero gas and the same span gas as used prior to the measurements. The test shall be considered acceptable if the difference between the two calibration results is less than 2%.

#### **Interpretation:**

For application of this section the following interpretations shall be applied:

- (a) The term "the calibration of the analysers shall be re-checked," shall be interpreted as the 'the zero and span response of the analysers shall be re-checked'.

(b) The term "if the difference between the two calibration results is less than 2%" shall be interpreted as 'if the difference between the two check results is less than 2%' where the 2% is understood to be 2% of the span gas (and not analyser full scale) value, i.e.: Maximum permitted difference in span or zero check readings (ppm or % as appropriate): = 0.02 • Initial span check reading

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

## **MPC**

### **74**

(July 2004)

## **Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

### **Chapter 5.10.1**

#### **Chapter 5.10**

*Test report*

Chapter 5.10.1 reads as follows:

For every engine tested for pre-certification or for initial certification on board without precertification, the engine manufacturer shall prepare a test report which shall contain, as a minimum, the data as set out in appendix 5 of this Code. The original of the test report shall be maintained on file with the engine manufacturer and a certified true copy shall be maintained on file by the Administration.

#### **Interpretation:**

For application of this section the term "as a minimum" shall be interpreted as incorporating the necessary data to fully define the engine performance and enable calculation of the gaseous emissions, in accordance with 5.12, from the raw data units to the cycle weighed NO<sub>x</sub> emission value in g/kWh. The data set given under Appendix 5 should not be considered definitive and any other test data (i.e. engine performance or setting data, description of control devices, etc.) relevant to the approval of a specific engine design and/or on-board NO<sub>x</sub> verification procedures must also be given.

With reference to appendix 5 of the Code it shall be further interpreted that:

(a) The term "Deviation" as given under "Sheet 3/5, Measurement equipment, Calibration" refers to the deviation of the analyser calibration and not the deviation of the span gas concentration.

(b) The fuel properties as given under "Sheet 3/5, Fuel characteristics, Fuel properties" shall, in those cases where a 'DM' grade fuel is used, include sufficient data to justify the ISO 8217 grade (i.e. DMA, DMB or DMC) as given on EIAPP Certificate Supplement 1.12 and hence as a minimum shall give the analysis results for water content (ISO 37733), carbon residue (ISO 10370) - full or 10% sample and, in the case of the DMA / DMB grades, Cetane Number / Index (ISO 4264).

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

## **MPC**

### **75**

(July 2004)

## **Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

### **Chapter 5.11**

*Data evaluation for gaseous emissions*

Chapter 5.11 reads as follows:

For the evaluation of the gaseous emissions, the chart reading of the last 60 seconds of each mode shall be averaged, and the average concentrations (conc) of CO, CO<sub>2</sub>, HC, NO<sub>x</sub>, and O<sub>2</sub> during each mode shall be determined from the average chart readings and the corresponding calibration data.

#### **Interpretation:**

For application of this section it shall be interpreted that the averaged results must be given to 2 decimal places for the CO<sub>2</sub> / O<sub>2</sub> species and whole numbers for the CO, HC and NO<sub>x</sub> species.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

## **MPC**

### **76**

(July 2004)

## **Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

### **Chapter 5.12.4.1**

#### **Chapter 5.12**

*Calculation of the gaseous emissions*

#### **Chapter 5.12.4**

*Calculation of the emission mass flow rates*

Chapter 5.12.4.1 reads as follows:

The emission mass flow rates for each mode shall be calculated as follows (for the raw exhaust gas):

Gas mass =  $u \cdot \text{conc} \cdot \text{GEXHW}$  (15)

or

Gas mass =  $v \cdot \text{conc} \cdot \text{VEXHD}$  (16)

or

Gas mass =  $w \cdot \text{conc} \cdot \text{VEXHW}$  (17)

**Interpretation:**

For application of this section it shall be interpreted that for equations (15) and (17) the term "conc" applies to the averaged gas concentrations, as determined in accordance with 5.11, measured or corrected in accordance with 5.12.2 (conc, dry / KW, r) to a wet basis and (in the case of NO<sub>x</sub>) multiplied by the KHDIES correction factor for humidity and temperature in accordance with 5.12.3. For equation (16) the term "conc" applies to the averaged gas concentrations, as determined in accordance with 5.11, measured or corrected in accordance with 5.12.2 (conc, wet • KW, r) to a dry basis and (in the case of NO<sub>x</sub>) multiplied by the KHDIES correction factor for humidity and temperature in accordance with 5.12.3.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC**

**77**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

**Chapter 6.2.1.2**

**Chapter 6.2**

*Engine parameter check method*

**Chapter 6.2.1**

*General*

Chapter 6.2.1.2 reads as follows:

An engine parameter check method shall be conducted on engines, subject to 6.2.1.1, whenever there is a change of components and/or adjustable features of the engine that affect NO<sub>x</sub> emission levels. This method shall be used to confirm compliance with the NO<sub>x</sub> emission limits. Engines installed in ships shall be designed in advance for an easy check of components, adjustable features and engine parameters that affect NO<sub>x</sub> emission levels.

**Interpretation:**

It shall be interpreted that a survey would additionally be required where the component or adjustable feature change was outside that already approved for the Engine Group or Engine Family and as given in the engine's Technical File. In such cases the change would need to be documented in accordance with 6.2.3.2.2. It shall be further interpreted that, in the case of the Engine Parameter Check Method, that the change is to be such that the Engine Group / Engine Family Parent Engine emission value was not exceeded.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

**MPC**

**78**

(July 2004)

(Rev.1

Mar 2006)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines**

**Chapter 6.2.3.4.2**

**Chapter 6.2**

*Engine parameter check method*

**Chapter 6.2.3**

*Documentation for an engine parameter check method*

**Chapter 6.2.3.4**

*List of NO<sub>x</sub>-influencing parameters sometimes modified on board*

Chapter 6.2.3.4.2 reads as follows:

The actual technical file of an engine may, based on the recommendations of the engine manufacturer and the approval of the Administration, include less components and/or parameters than discussed above depending on the particular engine and the specific design.

**Interpretation:**

For application of this section it shall be interpreted that the term “engine manufacturer” is the entity which applied for the engine certification.

(MEPC/Circ. 473)

**Note:**

1. This UI is to be uniformly implemented by IACS Societies from 19 May 2005.
2. Revision 1 of this UI is to be uniformly implemented by IACS Societies from 1 July 2006.

**MPC****79**

(July 2004)

(Rev.1

Mar 2006)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines****Chapter 6.2.3.5****Chapter 6.2**

*Engine parameter check method*

**Chapter 6.2.3**

*Documentation for an engine parameter check method*

**Chapter 6.2.3.5**

*Checklist for the engine parameter check method*

Chapter 6.2.3.5 reads as follows:

For some parameters, different survey possibilities exist. Approved by the Administration, the ship operator, supported by the engine manufacturer, may choose what method is applicable. Any one of, or a combination of, the methods listed in appendix 7 of this Code may be sufficient to show compliance.

**Interpretation:**

For application of this section it shall be interpreted that the term “engine manufacturer” is the entity which applied for the engine certification.

(MEPC/Circ. 473)

**Note:**

1. This UI is to be uniformly implemented by IACS Societies from 19 May 2005.
2. Revision 1 of this UI is to be uniformly implemented by IACS Societies from 1 July 2006

**MPC****80**

(July 2004)

(Rev.1

Mar 2006)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines****Appendix 4**

*Calibration of the analytical instruments (Refer to chapter 5 of the NOx Technical Code)*

**1 Introduction**

Chapter 1.1 reads as follows:

Each analyser used for the measurement of an engine's parameters shall be calibrated as often as necessary in accordance with the requirements of this appendix. Tables 1, 2 3 & 4 right hand column headers read as follows: Calibration intervals (month).

**Interpretation:**

For application of this section it shall be interpreted that the calibration intervals as defined by Tables 1, 2, 3, and 4 of Appendix 4 represent the duration of calibration validity applicable to the particular measurement instruments listed.

All instruments used for the measurement of an engine's parameters shall be verified as being within the defined calibration validity period at the time of the measurement.

(MEPC/Circ. 473)

**Note:**

1. This UI is to be uniformly implemented by IACS Societies from 19 May 2005
2. Revision 1 of this UI is to be uniformly implemented by IACS Societies from 1 July 2006.

**MPC****81**

(July 2004)

**Resolution 2 of the 1997 MARPOL Conference Technical Code on Control of Emission of**

## **Nitrogen Oxides from Marine Diesel Engines**

### **Appendix 4**

*Calibration of the analytical instruments (Refer to chapter 5 of the NOx Technical Code)*

#### **8.1**

##### **8**

*Interference effects with CO, CO<sub>2</sub>, NO<sub>x</sub> and O<sub>2</sub> analysers*

#### **8.1**

*CO analyser interference check*

8.1 reads as follows:

Water and CO<sub>2</sub> may interfere with the CO analyser performance. Therefore, a CO<sub>2</sub> span gas having a concentration of 80 to 100% of full scale of the maximum operating range used during testing shall be bubbled through water at room temperature and the analyser response recorded. The analyser shall not be more than 1% of full scale for ranges greater than or equal to 300ppm or more than 3ppm for ranges below 300ppm.

#### **Interpretation:**

For application of this section the term "The analyser shall not be more than ..." shall be interpreted as "The analyser response shall not be more than ..." to correctly reflect the intent of this statement and ISO 8178-1 Section 8.9.1.

Note:

This UI is to be uniformly implemented by IACS Societies from 19 May 2005.

## **MPC**

### **82**

(Sept. 2005)

#### **Annex VI of MARPOL 73/78**

##### **Regulation 14**

Deleted Nov 2013.

This UI covered the interim period between the entry into force of Annex VI (19 May 2005) and the time at which the ship's first IAPP Cert would be issued in accordance with Reg. 6. Although this UI would strictly be still be applicable to ships whose flag State only now ratify Annex VI – in which case the IAPP Cert. would again only need to be issued within the time period as given by Reg. 6 - in reality virtually all such ships will already need to be operating with some form of Statement of Compliance with Annex VI since the Annex is now an established requirement and hence will already need to comply as necessary when operating in the water's of signatory parties.

(IACS Ref. 8657\_)

## **MPC**

### **83**

(Sept. 2005)

#### **Annex VI of MARPOL 73/78**

##### **Regulation 18**

Deleted Nov 2013.

As with MPC 82 this UI also covered that interim period between the entry into force of Annex VI and the issue to the first IAPP Cert.

(IACS Ref. 8657\_)

## **MPC**

### **84**

(Nov 2005)

#### **Annex VI of MARPOL 73/78**

##### **Regulation 16 (9)**

Deleted Nov 2013.

Reg. 16.9 now gives that the 850°C requirement applies to both types of incinerator and further details specifically how it is to be applied.

(IACS Ref. 8657\_)

## **MPC**

### **92**

(Oct 2007)

#### **Annex VI Tonnage to be used when applying MARPOL**

**Regulation 5***Surveys and Inspections*

(1) Every ship of 400 gross tonnage and above and every fixed and floating drilling rig and other platforms shall be subject to the surveys specified below.

(2) In the case of ships of less than 400 gross tonnage, the Administration may establish appropriate measures in order to ensure that the applicable provisions of this Annex are complied with.

**Regulation 6***Issue of International Air Pollution Prevention Certificate*

(1) An International Air Pollution Prevention Certificate shall be issued, after survey in accordance with the provisions of regulation 5 of this Annex, to:

(a) any ship of 400 gross tonnage or above engaged in voyages to ports or offshore terminals under the jurisdiction of other Parties; and

**Interpretation**

1) This UI pertains to the gross tonnage to be used when applying MARPOL Annex VI.

2) When applying MARPOL Annex VI the gross tonnage as calculated in accordance with the tonnage measurements regulations contained in Annex I to the International Convention on Tonnage Measurements of Ships, 1969 or any successor Convention is to be used.

**Note:**

1. This Unified Interpretation is to be applied by all Members and Associates to ships the keels of which are laid after 1 January 2008.

**MPC****97**

(July 2010)

**Volatile Organic Compounds (VOCs) Management Plan****MARPOL VI****Regulation 15.6 and 15.7**

6 A tanker carrying crude oil shall have on board and implement a VOC Management Plan approved by the Administration. Such a plan shall be prepared taking into account the guidelines developed by the Organization. The plan shall be specific to each ship and shall at least:

1. provide written procedures for minimizing VOC emissions during the loading, sea passage and discharge of cargo;
  2. give consideration to the additional VOC generated by crude oil washing;
  3. identify a person responsible for implementing the plan; and
  4. for ships on international voyages, be written in the working language of the master and officers and, if the working language of the master and officers is not English, French, or Spanish, include a translation into one of these languages.
- 7 This regulation shall also apply to gas carriers only if the type of loading and containment systems allow safe retention of non-methane VOCs on board or their safe return ashore.

**Interpretation**

The requirement for a VOC Management Plan applies only to a tanker carrying crude oil.

**Note:**

1. This UI is to be uniformly implemented by IACS Societies from 1 August 2010.

**MPC****98**

(Jan 2012)

**“Time of the Replacement or Addition” for the Applicable Tier Standard For the Supplement to the IAPP Certificate****MARPOL Annex VI Regulation**

Reg 13.2.2 For a major conversion involving the replacement of a marine diesel engine with a non-identical marine diesel engine or the installation of an additional marine diesel engine, the standards in this regulation in force at the time of the replacement or addition of the engine shall apply.

**Interpretation**

The "time of the replacement or addition" of the engine is to be taken as the date of:

- a. the contractual delivery date of the engine to the ship\*; or
- b. in the absence of a contractual delivery date, the actual delivery date of the engine to the ship\*, provided that the date is confirmed by a delivery receipt; or
- c. in the event the engine is fitted onboard and tested for its intended purpose on or after 1 July 2016, the actual date that the engine is tested onboard for its intended purpose applies in determining the standards in this regulation in force at the time of the replacement or addition of the engine. The date in a), b) or c), provided the conditions associated with those dates apply, is the "Date of major conversion – According to Reg. 13.2.2" to be entered in the IAPPC Supplement.

In this case the "Date of installation", which applies only for identical replacement engines, shall be filled in with "N.A."

If the engine is not tested before 1 July 2016 due to unforeseen circumstances beyond their control of the ship owner, then the provisions of "unforeseen delay in delivery" may be considered by the Administration in a manner similar to MARPOL Annex I UI4.

**Note:**

\*) The engine is to be fitted onboard and tested for its intended purpose before 1 July 2016.

1. This UI is to be uniformly applied by IACS Societies to IAPP Certificates which are newly issued on or after 1 January 2013. Existing IAPP Certificates onboard are valid until their expiry.

**MPC**

**100**

(June 2012)

**Date of Delivery under SOLAS and MARPOL Conventions Under certain provisions of the SOLAS and MARPOL Conventions, the application of regulations to a new ship is governed by the dates:**

1. for which the building contract is placed on or after dd/mm/yyyy; or
2. 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 dd/mm/yyyy; or
3. the delivery of which is on or after dd/mm/yyyy.

**Interpretation**

For the purpose of determining the application of mandatory requirements of the SOLAS and MARPOL Conventions to a new ship, the date of “delivery” means the completion date (day, month and year) of the survey on which the certificate is based (i.e. the initial survey before the ship is put into service and certificate issued for the first time) as entered on the relevant statutory certificates.

Note:

This UI is to be uniformly implemented by IACS Societies from 28 June 2012.

**MPC**

**101**

(Jul 2012)

**Supplement to the International Air Pollution Prevention (IAPP) Certificate – Section 2.3 MARPOL Annex VI**

**Regulation 8**

“The International Air Pollution Prevention Certificate shall be drawn up in a form corresponding to the model given in appendix I to this Annex and shall be at least in English, French or Spanish. If an official language of the issuing country is also used, this shall prevail in case of a dispute or discrepancy.”

**Revised form of Supplement to the IAPP Certificate as per MEPC.194(61)**

**2.3 Sulphur oxides (SO<sub>2</sub>) and particulate matter (regulation 14)**

**2.3.1** When the ship operates outside of an Emission Control Area specified in regulation 14.3, the ship uses:

1. fuel oil with a sulphur content as documented by bunker delivery notes that doesn't exceed the limit value of:

- 4.50 % m/m (not applicable on or after 1 January 2012 ) or ...
- 3.50% mm ( not applicable on or after 1 January 2012 ) or ...
- 0.50% m/m, and/or .....

2. an equivalent arrangement approved in accordance with regulation 4.1 as listed in 2.6 that is at least as effective in terms of SO<sub>x</sub> emission reductions as compared to using a fuel oil with a sulphur content limit value of :

- 4.50% m/m (not applicable on or after 1 January 2012); or ...
- 3.50% m/m (not applicable on or after 1 January 2012); or ...
- 0.50% m/m.....

**2.3.2** When the ship operates inside an Emission Control Area specified in regulation 14.3, the ship uses:

1. fuel oil with a sulphur content as documented by bunker delivery notes that does not exceed the limit value of:

- 1.00% m/m (not applicable on or after 1 January 2015); or ...
- 0.10% m/m, and/or .....

2. an equivalent arrangement approved in accordance with regulation 4.1 as listed in 2.6 that is at least as effective in terms of SO<sub>x</sub> emission reductions as compared to using a fuel oil with a sulphur content limit value of :

- 1.00% m/m (not applicable on or after 1 January 2015); or ...
- 0.10% m/m .....

**Interpretation**

Section 2.3 of the Supplement ("as documented by bunker delivery notes") allows for an "x" to be entered in advance of the dates indicated in all of the relevant check boxes recognizing that the bunker delivery notes, required to be retained on board for a minimum period of three years, provide the subsequent means to check that a ship is actually operating in a manner consistent with the intent as given in section 2.3. Note: This UI is to be uniformly implemented by IACS Societies not later than the first IAPP renewal survey carried on/after 1 January 2013.

**MPC****102**

(July 2012)

**Surveys and certification relating to the Ship Energy Efficiency Management Plan (SEEMP)  
(MARPOL Annex VI Regulation 5.4.4)**

**Regulation 5.4 as amended by Resolution MEPC.203(62) reads:**

4 Ships to which Chapter 4 applies shall also be subject to the surveys specified below, taking into account Guidelines adopted by the Organization<sup>1</sup>:

4. For existing ships, the verification of the requirement to have a SEEMP on board according to regulation 22 shall take place at the first intermediate or renewal survey identified in paragraph 1 of this regulation, whichever is the first, on or after 1 January 2013

**Regulation 6.4 as amended by Resolution MEPC.203(62) reads:** 4 An International Energy Efficiency Certificate for the ship shall be issued after a survey in accordance with the provisions of regulation 5.4 to any ship of 400 gross tonnage and above before that ship may engage in voyages to ports or offshore terminals under the jurisdiction of other Parties.

**Interpretation**

1. The International Energy Efficiency Certificate (IEEC) shall be issued for both new and existing ships.

2. For existing ships a Ship Energy Efficiency Management Plan (SEEMP) required in accordance with Regulation 22, shall be verified onboard according to Regulation 5.4.4, and an IEEC shall be issued, not later than the first Intermediate or Renewal MARPOL Annex VI Chapter 2 survey, whichever is the sooner, on or after 1 January 2013, i.e. a survey connected to a intermediate/renewal survey of the IAPP Certificate.

3. The Intermediate or Renewal survey referenced in 2. relates solely to the timing for the verification of the SEEMP onboard, i.e. these IAPPC survey windows will also become the IEEC initial survey date for existing ships. The SEEMP is however a survey item solely under the new MARPOL Annex VI Chapter 4, and is not a survey item relating to IAPPC surveys.

4. In the event that the SEEMP is not found onboard during the first intermediate/renewal survey of the IAPP Certificate on or after 1 January 2013, then the RO should seek the advice of the Administration concerning the issuance of an IEEC and be guided accordingly. However, the validity of the IAPP Certificate is not impacted by the lack of a SEEMP as the SEEMP is a survey item solely under the new MARPOL Annex VI, Chapter 4, and not under the IAPPC surveys.

Note:

1. This Unified Interpretation is to be uniformly implemented by IACS Societies from 1 January 2013.

**MPC****103**

(Jan 2013)

**Identical Replacement Engines**

**(MARPOL Annex VI Regulation 13)**

**MARPOL Annex VI Regulation 13 reads:**

13.1.1.2 each marine diesel engine with a power output of more than 130 kW which undergoes a major conversion on or after 1 January 2000 except when demonstrated to the satisfaction of the Administration that such engine is an identical replacement to the engine which it is replacing and is otherwise not covered under paragraph 1.1.1 of this regulation.

13.2.2 For a major conversion involving the replacement of a marine diesel engine with a non-identical marine diesel engine or the installation of an additional marine diesel engine, the standards in this regulation in force at the time of the replacement or addition of the engine shall apply. ...."

**Interpretation**

In regulation 13.1.1.2 the term "identical" (and hence, by application of the converse, in regulation 13.2.2 the term "nonidentical") as applied to engines under Regulation 13 is to be taken as:

An 'identical engine' is, as compared to the engine being replaced\*, an engine which is of the same:  
design and model;

rated power;

rated speed;

use;

number of cylinders;

fuel system type (including, if applicable, injection control software); and

(a) for engines without EIAPP certification, have the same NOx critical components and settings\*\*; or



(b) for engines with EIAPP certification, belonging to the same Engine Group / Engine Family.

**Note:**

1. This Unified Interpretation is to be uniformly implemented by IACS Societies for “.. a time of the replacement ..” of an engine, as interpreted by UI MPC 98, occurring on or after 1 January 2014.

\* In those instances where the replaced engine will not be available to be directly compared with the replacing engine at the time of updating the Supplement to the IAPP Certificate reflecting that engine change it is to be ensured that the necessary records in respect of the replaced engine are available in order that it can be confirmed that the replacing engine represents “an identical engine”.

\*\* For engines without EIAPP Certification there will not be the defining NOx critical component markings or setting values as usually given in the approved Technical File. Consequently in these instances the assessment of ‘... same NOx critical components and settings...’ shall be established on the basis that the following components and settings are the same:

**Fuel system**

- (a) Fuel pump model and injection timing
- (b) Injection nozzle model

**Charge air**

- (a) Configuration and, if applicable, turbocharger model and auxiliary blower specification
- (b) Cooling medium (seawater / freshwater)

## **MPC**

### **105**

(Nov 2013)

#### **Gaseous emissions calculation of marine diesel engines fitted with selective catalytic reduction (SCR) systems**

##### **Resolution MEPC.198(62)**

5.2.1 The calculation method in section 5.12 of the NTC 2008 is also applied to engine systems fitted with SCR. No allowance is made for the reductant solution injected into the exhaust gas stream in respect of its effect on exhaust gas mass flow rate calculation (appendix VI) or dry/wet correction factor (equation (11), paragraph 5.12.3.2.2 of the NTC 2008). The NO<sub>x</sub> correction factor for humidity and temperature (equations (16) or (17), paragraphs 5.12.4.5 and 5.12.4.6, respectively, of the NTC 2008) should not be applied.

##### **Interpretation**

The gaseous emissions calculation method given in Resolution MEPC.198(62) paragraph 5.2.1 for Scheme A is the approach to use, it applies to both Scheme A and Scheme B certification of marine diesel engines fitted with selective catalytic reduction (SCR) systems.