TÜRK LOYDU

TL-I MPC

Interpretations of the International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978 relating thereto and its Annexes

July 2019

These interpretations are prepared by embedding related IACS Unified Interpretations. In order to have consistency, the numbering of the interpretations are kept as the same with related IACS Unified Interpretations.

Unless otherwise specified, these Rules apply according to the implementation dates as defined in each interpretation. See Rule Change Summary on TL website for revision details.

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MPC 116 2011 Guidelines Addressing Additional Aspects to the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems (Resolution MEPC.198(62), Section 3.2.1.12)

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MPC 120 2011 Guidelines Addressing Additional Aspects to the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems
(Resolution MEPC.198(62), Section 5.2.2)

MPC 121 2011 Guidelines Addressing Additional Aspects to the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems
(Resolution MEPC.198(62), Section 6.3.1.1) Withdrawn

MPC 122 2011 Guidelines Addressing Additional Aspects to the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems
(Resolution MEPC.198(62), Section 6.3.2.1.2)

MPC 123 2011 Guidelines Addressing Additional Aspects to the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems
(Resolution MEPC.198(62), Section 6.3.2.1.5)

MPC 124 2011 Guidelines Addressing Additional Aspects to the NOx Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems
(Resolution MEPC.198(62), Section 7.5) Withdrawn

MPC 125 Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines (Nox Technical Code 2008, Chapter 4, Paragraph 4.4.6.1)

MPC 126 Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines (Nox Technical Code 2008, Chapter 4, Paragraph 4.4.6.2)

TL- I MPC6 Calculation of the aggregate capacity of SBT

(Regulation 19.3.4)

19.3.4 The aggregate capacity of ballast tanks

On crude oil tankers of 20,000 tonnes deadweight and above and product carriers of 30,000 tonnes deadweight and above, the aggregate capacity of wing tanks, double bottom tanks, forepeak tanks and after peak tanks shall not be less than the capacity of segregated ballast tanks necessary to meet the requirements of regulation 18 of this Annex. Wing tanks or spaces and double bottom tanks used to meet the requirements of regulation 18 shall be located as uniformly as practicable along the cargo tank length. Additional segregated ballast capacity provided for reducing longitudinal hull girder bending stress, trim, etc. may be located anywhere within the ship.

Interpretation

1. Any ballast carried in localized inboard extensions, indentations or recesses of the double hull, such as bulkhead stools, should be excess ballast above the minimum requirement for segregated ballast capacity according to regulation 18.

2. In calculating the aggregate capacity under regulation 19.3.4, the following should be taken into account:

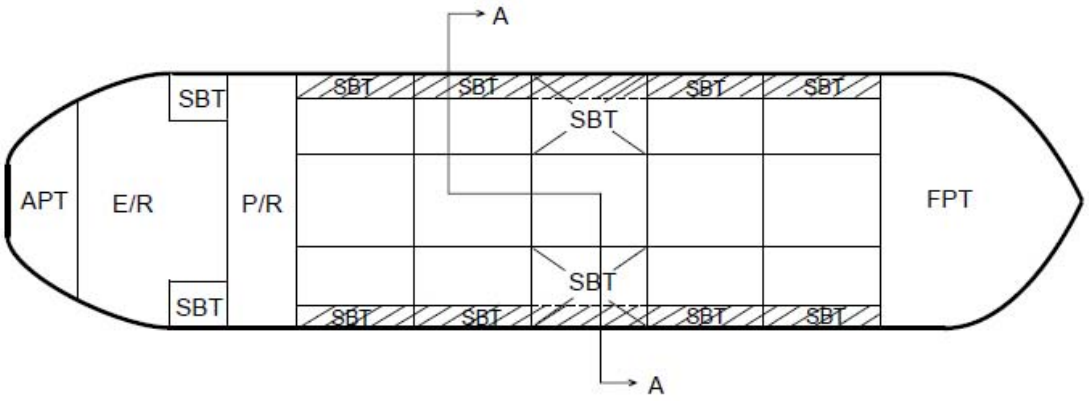
2.1 the capacity of engine-room ballast tanks should be excluded from the aggregate capacity of ballast tanks;

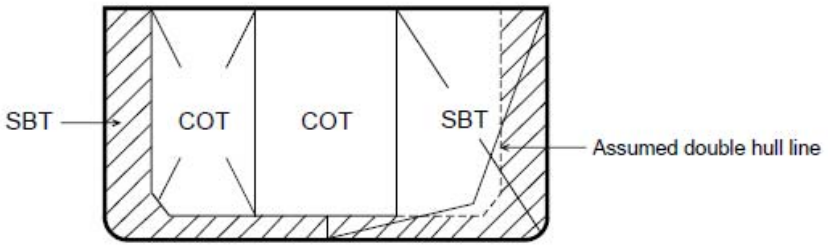
2.2 the capacity of ballast tank located inboard of double hull should be excluded from the aggregate capacity of ballast tanks (see figure 1).

Notes:

1. This interpretation is implemented for ships contracted for construction on or after 1 July 2016.

2. The “contracted for construction” date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of “contract for construction”, refer to TL- PR 29.





SECTION A-A

Fig. 1

2.3 spaces such as void spaces located in the double hull within the cargo tank length should be included in the aggregate capacity of ballast tanks (see figure 2).

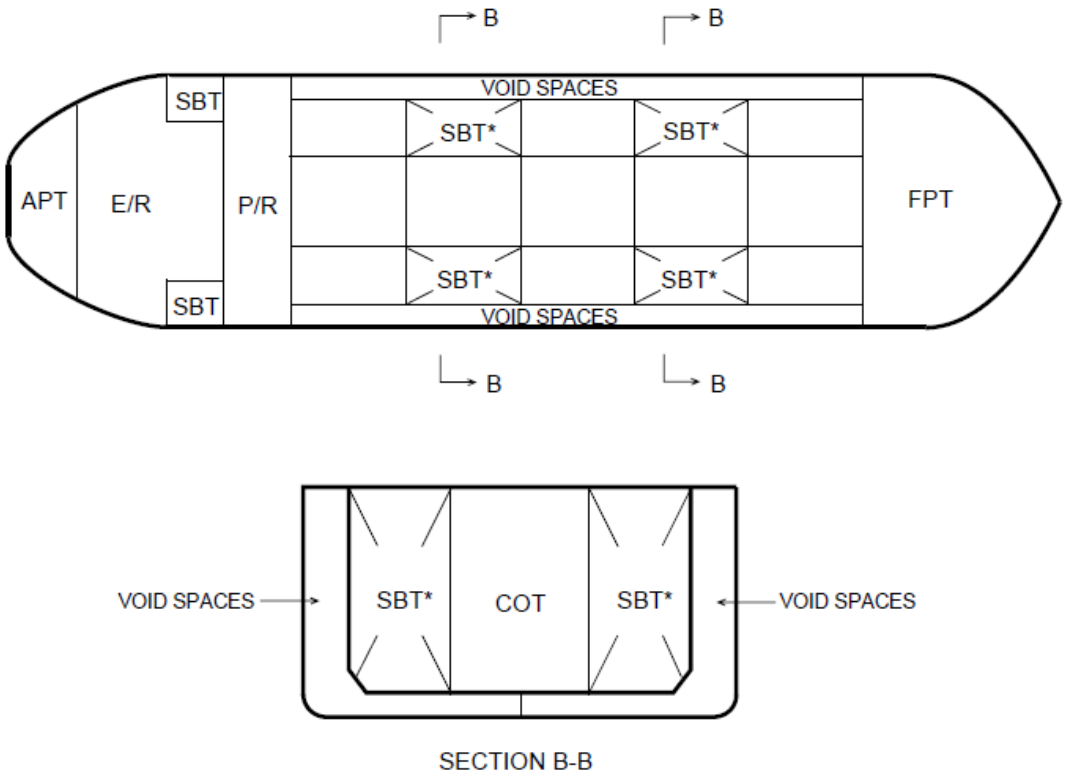


Fig. 2

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MPC11

Interpretation to MARPOL I/27

Regulation 27

Intact stability

1 Every oil tanker of 5,000 tonnes deadweight and above delivered on or after 1 February 2002, as defined in regulation 1.28.7, shall comply with the intact stability criteria specified in paragraphs 1.1 and 1.2 of this regulation, as appropriate, for any operating draught under the worst possible conditions of cargo and ballast loading, consistent with good operational practice, including intermediate stages of liquid transfer operations. Under all conditions the ballast tanks shall be assumed slack.

.1 In port, the initial metacentric height GM_o, corrected for the free surface measured at 0° heel, shall be not less than 0.15 m;

.2 At sea, the following criteria shall be applicable:

*.2.1 the area under the righting lever curve (GZ curve) shall be not less than 0.055 m.rad up to θ = 30° angle of heel and not less than 0.09 m.rad up to θ = 40° or other angle of flooding θ_f * if this angle is less than 40°. Additionally, the area under the righting lever curve (GZ curve) between the angles of heel of 30° and 40° or between 30° and θ_f , if this angle is less than 40°, shall be not less than 0.03 m.rad;*

.2.2 the righting lever GZ shall be at least 0.20 m at an angle of heel equal to or greater than 30°;

Note:

1. This interpretation is implemented on ships contracted for construction on or after 1 January 2017.

2. The damage stability requirements in MARPOL I/28 shall not apply for the purpose of demonstrating compliance with MARPOL Reg. I/27.

3. The “contracted for construction” date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of “contract for construction”, refer to TL- PR 29.

.2.3 the maximum righting arm shall occur at an angle of heel preferably exceeding 30° but not less than 25°; and

.2.4 the initial metacentric height GM_o, corrected for free surface measured at 0° heel, shall be not less than 0.15 m.

** θ_f is the angle of heel at which openings in the hull superstructures or deckhouses which cannot be closed weathertight immerse. In applying this criterion, small openings through which progressive flooding cannot take place need not be considered as open.*

2 The requirements of paragraph 1 of this regulation shall be met through design measures. For combination carriers simple supplementary operational procedures may be allowed.

3 Simple supplementary operational procedures for liquid transfer operations referred to in paragraph 2 of this regulation shall mean written procedures made available to the master which:

.1 are approved by the Administration;

.2 indicate those cargo and ballast tanks which may, under any specific condition of liquid transfer and possible range of cargo densities, be slack and still allow the stability criteria to be met. The slack tanks may vary during the liquid transfer operations and be of any combination provided they satisfy the criteria;

.3 will be readily understandable to the officer-in-charge of liquid transfer operations;

.4 provide for planned sequences of cargo/ballast transfer operations;

.5 allow comparisons of attained and required stability using stability performance criteria in graphical or tabular form;

.6 require no extensive mathematical calculations by the officer-in-charge;

.7 provide for corrective actions to be taken by the officer-in-charge in case of departure from recommended values and in case of emergency situations; and

.8 are prominently displayed in the approved trim and stability booklet and at the cargo/ballast transfer control station and in any computer software by which stability calculations are performed.

Interpretation

For proving compliance with Reg. I/27, either paragraph 1 or 2, below, shall be applied.

1. The vessel shall be loaded with all cargo tanks filled to a level corresponding to the maximum combined total of vertical moment of volume plus free surface inertia moment at 0° heel, for each individual tank. Cargo density shall correspond to the available cargo deadweight at the displacement at which transverse KM reaches a minimum value, assuming full departure consumables and 1% of the total water ballast capacity. The maximum free surface moment shall be assumed in all ballast conditions. For the purpose of calculating GMo, liquid free surface corrections shall be based on the appropriate upright free surface

inertia moment. The righting lever curve may be corrected on the basis of liquid transfer moments.

2. An extensive analysis covering all possible combinations of cargo and ballast tank loading is to be carried out. For such extensive analysis conditions it is considered that:

(a) Weight, centre of gravity co-ordinates and free surface moment for all tanks are to be according to the actual content considered in the calculations.

(b) The extensive calculations are to be carried out in accordance with the following:

1. The draughts are to be varied between light ballast and scantling draught.

2. Consumables including but not restricted to fuel oil, diesel oil and fresh water corresponding to 97%, 50% and 10% content are to be considered.

3. For each draught and variation of consumables, the available deadweight is to comprise ballast water and cargo, such that combinations between maximum ballast and minimum cargo and vice-versa, are covered. In all cases the number of ballast and cargo tanks loaded is to be chosen to reflect the worst combination of VCG and free surface effects. Operational limits on the number of tanks considered to be simultaneously slack and exclusion of specific tanks are not permitted. All ballast tanks are to have at least 1% content.

4. Cargo densities between the lowest and highest intended to be carried are to be considered.

5. Sufficient steps between all limits are to be examined to ensure that the worst conditions are identified. A minimum of 20 steps for the range of cargo and ballast content, between 1% and 99% of total capacity, are to be examined. More closely spaced steps near critical parts of the range may be necessary.

At every stage the criteria described in MARPOL Reg. I/27 paragraphs 1.1 and 1.2 are to be met.

3. In applying θ_f, openings which “cannot be closed weathertight” include ventilators (complying with ILLC 19(4)) that for operational reasons have to remain open to supply air to the engine room or emergency generator room (if the same is considered buoyant in the stability calculation or protecting openings leading below) for the effective operation of the ship.

TL-I MPC12 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 interpretation is implemented from 1 January 2015.

TL-I MPC14 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 NO_x 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 interpretation is implemented from 1 January 2015.

TL- I MPC20 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 non-identical 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.” as 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 interpretation of “date of installation” see TL- I MPC 98

Note:

1. This interpretation is implemented from 1 January 2015.

TL- I MPC29

Annex VI of MARPOL 73/78

Regulations 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 regulations 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 interpretation is implemented from 1 January 2015.

TL- I
MPC30

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} = PSY, test ambient vapour pressure)	kPa
p_B	Total barometric pressure (in ISO 3046-1, 1995: p_x = PX, site ambient total pressure; py = PY, test ambient total pressure)	kPa
p_s	Dry atmospheric pressure	kPa
R_a	Relative humidity of the intake air	%
T_a	Absolute temperature of the intake air	K

Interpretation:

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

$$p_S = p_B - \frac{R_a \bullet p_a}{100}$$

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 interpretation is implemented from 19 May 2005.

TL- I
MPC31

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_x emission limits.

Interpretation:

For application of this section the term "installed" shall be interpreted as per TL-I MPC 14.

Note:
This interpretation is implemented from 19 May 2005.

TL- I
MPC32

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 NO_x 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 interpretation is implemented from 19 May 2005.

TL- I
MPC33

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 pre-certified 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 NO_x Technical Code; and

(c) the application average weighted NO_x 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 interpretation is implemented from 1 July 2006.

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MPC34

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 NO_x emission limits as required by regulation 13 of Annex VI, a NO_x–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 NO_x emission limits. However, in this case, the assembly may be retested in accordance with the simplified measurement method addressed in 6.3. The NO_x–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 NO_x 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 NO_x emission limit requirements before a NO_x reducing device is installed. Where it is intended from the outset that a NO_x 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_x-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_x reducing device would need to be fitted in order to meet the Regulation 13 NO_x 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_x 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_x reduction device. Consequently Item 1.15 of the Supplement to EIAPP Certificate shall give the actual NOx emission value (g/kWh) for the engine with the NO_x reduction device in operation.

(d) The efficiency of the NO_x–reducing device (as demonstrated) shall be considered as unique to the Engine Group as tested and therefore non-transferable. Hence should the same NO_x – reducing device be used for another Engine Group the whole assemblage (engine + NO_x 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 interpretation is implemented from 19 May 2005.

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MPC35

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 figure 1 of appendix 2 of this Code.

Interpretation:

The text in chapter 2 gives the certification procedures which shall be followed. Where discepancies exists with figure 1, the text of chapter 2 takes precedence.
(MEPC/Circ. 473)

Note:
1. This interpretation is implemented from 1 July 2006.

TL- I
MPC36

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_x 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_x emission value (g/kW h)

The appropriate application average weighted NO_x 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_x 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_x–reducing device the actual NO_x emission value (g/kWh) for the engine with the NO_x reduction device in operation shall be given.

Note:
This interpretation is implemented from 19 May 2005.

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MPC37

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_x 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_x 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_x 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_x emissions by the direct measurement method shall meet the requirements of MEPC Resolution 103(49) 'Guidelines for On-board NO_x Verification Procedure – Direct Measurement and Monitoring Method'.

Note:
This interpretation is implemented from 19 May 2005.

TL- I
MPC38

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_x 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_x emissions to be determined in accordance with MEPC Resolution 103(49) 'Guidelines for On-board NO_x Verification Procedure – Direct Measurement and Monitoring Method'.

Note:
This interpretation is implemented from 19 May 2005.

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MPC39

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 interpretation is implemented from 1 July 2006.

TL- I
MPC40

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 NO_x emission performance is verified to be within the required limits by: a direct on-board NO_x monitoring, as approved by the Administration; a simplified on-board NO_x measurement; or, reference to the test-bed testing for the relevant engine group approval showing that the adjustments or modifications do not exceed the NO_x emission limits.

Interpretation:

This section shall be interpreted as follows:

(a) Verification by the direct on-board NO_x monitoring method is only applicable to the re-issue 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 NO_x monitoring or simplified on-board NO_x 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 Pre-certification Survey stage.

Note:
This interpretation is implemented from 19 May 2005.

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MPC41

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 NO_x verification procedures.

Note:
This interpretation is implemented from 19 May 2005.

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MPC42

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 interpretation is implemented from 1 July 2006.

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MPC43

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 NO_x 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 NO_x emissions.

Interpretation:

This section shall be interpreted as follows:

Where a NO_x 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 interpretation is implemented from 1 July 2006.

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MPC44

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 NO_x 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 interpretation is implemented from 19 May 2005.

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MPC45

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 NO_x 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 NO_x 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 NO_x 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 NO_x 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 NO_x 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 interpretation is implemented from 19 May 2005.

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MPC46

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 NO_x 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 NO_x 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 NO_x 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 NO_x verification procedure approved by the Administration for that particular engine.

Note:
This interpretation is implemented from 19 May 2005.

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MPC47

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 NO_x verification procedures

Chapter 2.4.4.3 reads as follows:

On-board NO_x 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 NO_x verification procedures have been approved by the Administration taking into account MEPC Resolution 103(49) the 'Guidelines for On-board NO_x Verification Procedure – Direct Measurement and Monitoring Method'.

Note:
This interpretation is implemented from 19 May 2005.

TL- I
MPC48

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 NO_x verification procedures

Chapter 2.4.5 reads as follows:

When a NO_x monitoring and recording device is specified as on-board NO_x 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 NO_x 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 NO_x Verification Procedure – Direct Measurement and Monitoring Method' defines the guidelines as developed by the Organization.

Note:
This interpretation is implemented from 19 May 2005.

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MPC49

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 NO_x emission limits for marine diesel engines

Chapter 3.1.1 reads as follows:

The graph in figure 1 represents the maximum allowable NO_x emission limit values based on the formulae included in paragraph 3(a) of regulation 13 of Annex VI. The total weighted NO_x 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 NO_x 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 interpretation is implemented from 19 May 2005.

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MPC50

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 NO_x 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 NO_x 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 interpretation is implemented from 19 May 2005.

TL- I MPC51 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 NO_x 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 NO_x 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:

1. This interpretation is implemented from 19 May 2005.

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MPC52

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 interpretation is implemented from 19 May 2005.

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MPC53

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_x 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_x emission characteristics, are used as produced, and, during installation on board, require no adjustments or modifications which could adversely affect the NO_x 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 test-bed.

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_x 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 interpretation is implemented from 19 May 2005.

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MPC54

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_x 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 NOx Technical Code Chapter 5.

Note:
This interpretation is implemented from 19 May 2005.

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MPC55

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 NO_x 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 NO_x 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 NO_x 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 NO_x emissions. These procedures shall cover drawing number allocation, effect on the identification markings on the NO_x 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 NO_x 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 NO_x 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, Engine Group and single engines.

Note:
This interpretation is implemented from 19 May 2005.

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MPC56

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 NO_x 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 NO_x 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 NO_x 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 NO_x emission levels of the engines within that family. If engines within the family incorporate other variable features which could be considered to affect NO_x 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 NO_x 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 NO_x emission value is to be stated under 1.15 of the EIAPP Certificate.

Note:
This interpretation is implemented from 19 May 2005.

TL- I
MPC57

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 NO_x 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
- $dp/d\alpha$, 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 NO_x emission, at the applicable test cycle, according to section 4.3.9.1.

Note:
This interpretation is implemented from 19 May 2005.

TL- I
MPC58

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 NO_x 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 NO_x 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 NO_x 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 interpretation is implemented from 19 May 2005.

TL- I
MPC59

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 NO_x emission;

.5 design features of the fuel injection system, plunger and injection cam which may profile basic characteristics that effect NO_x 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 NO_x 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 interpretation is implemented from 19 May 2005.

TL- I
MPC60

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 NO_x emission levels of regulation 13 (3) of Annex VI at an ambient seawater temperature of $25^{O}C$.*

* $25^{O}C$ seawater temperature is the reference ambient condition to comply with the NO_x limits. An additional temperature increase due to heat exchangers installed on board, e.g., for the low-temperature cooling water system, shall be taken into consideration.

Interpretation:

For application of this section it shall be interpreted that the $25^{O}C$ seawater temperature defines an ambient reference value for which compliance with the NO_x emission limits as defined by regulation 13 (3) must be demonstrated (tested or calculated with $T_{SC\ Ref}$ 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_x limits shall be demonstrated (or otherwise justified) with a charge air / scavenge air cooler coolant inlet temperature of $25^{O}C$.

(b) Intermediate ‘freshwater’ cooling to engine charge air coolers. Compliance with the NO_x 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 $25^{O}C$.

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_x limits must be demonstrated with the engine and charge air cooling systems operating “as intended for installation on board”.

Note:
This interpretation is implemented from 19 May 2005.

TL- I
MPC61

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_x emissions shall be stated and justified by the manufacturer.

Note:
This interpretation is implemented from 19 May 2005.

TL- I
MPC62

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 interpretation is implemented from 1 July 2006.

TL- I
MPC63

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 interpretation is implemented from 19 May 2005.

TL- I
MPC64

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 NO_x 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 interpretation is implemented from 19 May 2005.

TL- I
MPC65

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 NO_X emissions shall be stated and justified by the manufacturer.

Note:
This interpretation is implemented from 19 May 2005.

TL- I
MPC66

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_2, HC, NO_x, O_2) 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 interpretation is implemented from 1 July 2006.

TL- I
MPC67

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_1, 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^{o}C)$\pm$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_4 or C_3H_8 in air) calibration and span check gas is to be used.

Note:
This interpretation is implemented from 19 May 2005.

TL- I
MPC68

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^{o}C) at the probe.

Interpretation:

Recognising that successful measurement of gaseous HC requires an exhaust gas temperature of at least 190^{o}C, the 70^{o}C requirement shall be interpreted as a minimum exhaust gas temperature requirement at the NO_x sampling probe where that differs from the HC sampling probe. In the latter case a minimum temperature of 463 K (190^{o}C) 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 (190^{o}C) ± 10 K.

Note:
This interpretation is implemented from 19 May 2005.

TL- I
MPC69

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 turbocharger tailpipes 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 interpretation is implemented from 19 May 2005.

TL- I
MPC70

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 interpretation is implemented from 19 May 2005.

TL- I
MPC71

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 ± 1% of rated speed or 3 min^{-1}, 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 interpretation is implemented from 19 May 2005.

TL- I
MPC72

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 interpretation is implemented from 1 July 2006.

TL- I
MPC73

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 interpretation is implemented from 19 May 2005.

TL- I
MPC74

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 pre-certification, 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_x 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_x 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 interpretation is implemented from 19 May 2005.

TL- I
MPC75

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_2, HC, NO_x, and O_2 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_2 / O_2 species and whole numbers for the CO, HC and NO_x species.

Note:
This interpretation is implemented from 19 May 2005.

TL- I
MPC76

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 • conc • G_{EXHW} (15)

or

Gas mass = v • conc • V_{EXHD} (16)

or

Gas mass = w • conc • V_{EXHW} (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 / $K_{W, r}$) to a wet basis and (in the case of NO_x) multiplied by the K_{HDIES} 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 • $K_{W, r}$) to a dry basis and (in the case of NO_x) multiplied by the K_{HDIES} correction factor for humidity and temperature in accordance with 5.12.3.

Note:
This interpretation is implemented from 19 May 2005.

TL- I
MPC77

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_x emission levels. This method shall be used to confirm compliance with the NO_x 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_x 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 interpretation is implemented from 19 May 2005.

TL- I
MPC78

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_x –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 interpretation is implemented from 1 July 2006.

TL- I
MPC79

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 interpretation is implemented from 1 July 2006

TL- I
MPC80

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 NO_x 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 interpretation is implemented from 1 July 2006.

TL- I
MPC81

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 NO_x Technical Code)**

8.1

8 Interference effects with CO, CO_2, NO_x and O_2 analysers

8.1 *CO analyser interference check*

8.1 reads as follows:

Water and CO_2 may interfere with the CO analyser performance. Therefore, a CO_2 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 interpretation is implemented from 19 May 2005.

TL- I MPC87

Annex I of MARPOL 73/78 Regulation 12A as amended by Resolution MEPC.141(54)

Regulation 12A.9, as amended by Resolution MEPC.141(54), reads:

"Lines of oil fuel piping located at a distance from the ship's bottom of less than h, as defined in paragraph 6, or from the ship's side less than w, as defined in paragraphs 7 and 8 shall be fitted with valves or similar closing devices within or immediately adjacent to the oil fuel tank. These valves shall be capable of being brought into operation from a readily accessible enclosed space the location of which is accessible from the navigation bridge or propulsion machinery control position without traversing exposed freeboard or superstructure decks.
The valves shall close in case of remote control system failure (fail in a closed position) and shall be kept closed at sea at any time when the tank contains oil fuel except that they may be opened during oil fuel transfer operations."

Regulation 12A.10, as amended by Resolution MEPC.141(54), reads:

"Suction wells in oil fuel tanks may protrude into the double bottom below the boundary line defined by the distance h provided that such wells are as small as practicable and the distance between the well bottom and the bottom shell plating is not less than 0.5 h."

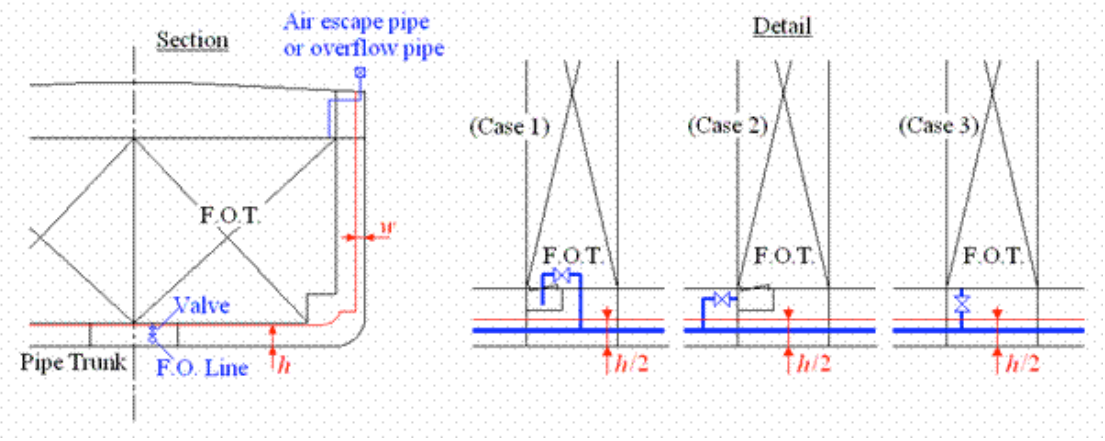
Interpretation:

1. Valves for oil fuel tanks located in accordance with the provisions of paragraphs 6, 7 and 8 of MARPOL regulation I/12A may be treated in a manner similar to the treatment of suction wells as per MARPOL regulation I/12A.10 and therefore arranged at a distance from the ship's bottom of not less than *h/2* (see the figure below).

2. Valves for tanks which are permitted to be located at a distance from the ship's bottom or side at a distance less than *h* or *w*, respectively, in accordance with the accidental oil fuel outflow performance standard of MARPOL regulation I/12A.11 may be arranged at the distance less than *h* or *w*, respectively.

3. Fuel tank air escape pipes and overflow pipes are not considered as part of *'lines of fuel oil piping"* and therefore may be located at a distance from the ship's side of less than *w*.

Note:
This interpretation is applied on ships delivered on or after 1 August 2010 as defined in MARPOL regulation I/28.9.


Section
Air escape pipe
or overflow pipe
F.O.T.
w
Valve
Pipe Trunk
F.O. Line
h
Detail
(Case 1)
F.O.T.
h/2
(Case 2)
F.O.T.
h/2
(Case 3)
F.O.T.
h/2

TL- I

MPC93

Annex I of MARPOL 73/78 Regulation 23 Accidental oil outflow performance, as amended by Resolution MEPC.117(52)

Regulation 23.7.3.2, as amended by Resolution MEPC.117(52) reads:

"The cargo level after damage shall be calculated as follows:

$h_c = \{(d_s + t_c - Z_1)(\rho_s) - (1000p)/g\}/\rho_n$"

where the overpressure *p* is defined as:

"p = if an inert gas system is fitted, the normal overpressure, in kilopascals, to be taken as not less than 5 kPa; if an inert gas system is not fitted, the overpressure may be taken as 0."

Interpretation

If an inert gas system is fitted, the normal overpressure, in KPa, is to be taken as 5 KPa.

Note:

1. This interpretation is applied on ships subject to MARPOL I, regulation 23, as amended by Resolution MEPC.117(52), which are contracted for construction on or after 1 July 2017.

2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to TL- PR 29.

TL- I MPC97 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 interpretation is implemented from 1 August 2010.

TL-I MPC98 “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 the 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 TL-I MPC4.

_____

Footnote:

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

Note

1. This interpretation is applied to IAPP Certificates which are newly issued on or after 1 January 2013. Existing IAPP Certificates onboard are valid until their expiry.

TL- I

MPC99

Oil residue (sludge) tank discharge connections to the bilge system, oily bilge water holding tank(s), tank top or oily water separators (MARPOL 73/78 Annex I Regulation 12.2)

MARPOL 73/78 Annex I (as amended by MEPC.187(59)) Regulation 12.2

2. Oil residue (sludge) may be disposed of directly from the oil residue (sludge) tank(s) through the standard discharge connection referred to in regulation 13, or any other approved means of disposal. The oil residue (sludge) tank(s):

> *.2.* ***shall have no discharge connections to the bilge system, oily bilge water holding tank(s), tank top or oily water separators*** *except that the tank(s) may be fitted with drains, with manually operated self-closing valves and arrangements for subsequent visual monitoring of the settled water, that lead to an oily bilge water holding tank or bilge well, or an alternative arrangement, provided such arrangement does not connect directly to the bilge piping system.*

MARPOL 73/78 Annex I Unified Interpretation to regulation 12.2.2 introduced by MEPC.1/Circ.753

2 ***There should be no interconnections between the sludge tank discharge piping and bilge-water piping*** *other than possible common piping leading to the standard discharge connection referred to in regulation 13.*

Interpretation

Screw-down non-return valves arranged in lines connecting to common piping leading to the standard discharge connection required by regulation 13, to prevent sludge from discharging to the bilge system, oily bilge water holding tank(s), tank top or oily water separators, provide a means equivalent to an arrangement that has “no interconnection” or “no discharge connections” as so specified in regulation 12.2 and Unified Interpretation thereto.

It is understood that the common piping may serve only one purpose and that is to connect the discharge lines of the bilge and sludge pumps to the standard discharge connection referred to in regulation 13, or any other approved means of disposal.

NOTE

1. This interpretation is implemented from 1 July 2012.

TL- I MPC100 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 interpretation is implemented from 28 June 2012.

TL- I MPC101

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_x) 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 does not exceed the 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 2020); 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_x 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 2020); 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_x 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 interpretation is implemented not later than the first IAPP renewal survey carried on/after 1 January 2013.

TL- I MPC103 Identical Replacement Engines MARPOL Annex VI Regulation 13)

egulation

MARPOL Annex VI Regulation 13

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 "non-identical") 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 NO_x critical components and settings**; or
(b) for engines with EIAPP certification, belonging to the same Engine Group / Engine Family.

NOTE:

1. This interpretation is implemented for ".. a time of the replacement .." of an engine, as interpreted by TL- I 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 NO_x critical component markings or setting values as usually given in the approved Technical File. Consequently in these instances the assessment of ‘... same NO_x 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)

TL- I MPC105

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_x 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.

Notes:

1. This interpretation is implemented from 1 January 2015.

TL- I MPC106 Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines (NO_x Technical Code 2008)

This UI addresses the status of licensees relative to the conformity of production arrangements from the entity which proposed the Engine Family or Engine Group in the first instance. The interpreted paragraphs of the NO_x Technical Code are as follows:

4.3 Application of the engine family concept

4.3.7. 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.

4.4 Application of the engine group concept

4.4.5. Before granting an initial engine group approval for 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.

Interpretation

An Engine Family / Group approval, as applicable, is granted to the entity requesting to apply the Engine Family or Engine Group concept to serially produced marine diesel engines.

The conformity of production arrangements as required by 4.3.7 as proposed by the entity seeking Engine Family / Group approval and as accepted by the Administration are to cover those marine diesel engines within that particular Engine Family / Group as manufactured by that entity.

Additionally, where that entity has in place arrangements which extend, under their oversight and control, the accepted conformity of production arrangements to other engine manufacturers (i.e. licensees), then candidate marine diesel engines produced by those other parties may be included in the Engine Family / Group as established. In this circumstance the marine diesel engine selected, and accepted by the Administration as the Parent Engine, may be manufactured either by the entity which requested the Engine Family / Group certification or by one of the other parties as covered by the agreed conformity of production arrangements.

Note:

1. This interpretation is applied when an application for first EIAPP certification for a marine diesel engine is dated on or after 1 July 2016.

In those instances where serially produced marine diesel engines are manufactured outside an accepted conformity of production arrangement then it is the responsibility of the manufacturer of those marine diesel engines themselves to request certification in accordance with the requirements of the NO_x Technical Code 2008 from the relevant Administration including the establishment of the relevant Engine Family / Group, selection and testing of the Parent Engine and the development of the particular conformity of production arrangements which are to cover those marine diesel engines.

TL- I
MPC108

2011 Guidelines Addressing Additional Aspects to the NO_x Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems (Resolution MEPC.198(62), Section 3.2.1.3)

MEPC.198(62), Section 3.2.1.3 reads:

3.2.1 In addition to the information supplied in paragraph 3.1.3 of these guidelines and items in section 2.4 of the NTC 2008, engine systems fitted with SCR should include the following information in its Technical File:

> *.3 design features of SCR specific components in the exhaust duct from the engine exhaust manifold to the SCR chamber;*

Interpretation

The engine technical file is to include any exhaust duct parameters which may affect NO_x emissions. This may include, but not be limited to:

a) Any restrictions specified by the applicant relating to exhaust duct configuration/design, including the position and number of bends in exhaust duct along with orientation and geometry, exhaust duct changes of diameter and arrangements fitted to manipulate exhaust flow, where applicable
b) Minimum distance between reductant injection point(s) and SCR chamber
c) Position of reductant injection equipment within duct and the direction of reductant injection, e.g. counter flow or parallel flow
d) Reductant mixing arrangements
e) Reductant lances, nozzles, atomising arrangement
f) Inlet plenum design, top entry or bottom entry
g) SCR by-pass arrangements, when fitted

When a by-pass is fitted then the by-pass valve and its control arrangements are to be considered NO_x critical components.

When it is proposed to use an integrated reductant injection and SCR chamber arrangement which is supplied as a packaged item to be fitted into an exhaust duct then the parameters of such a unit which may affect NO_x emissions are to be specified by the applicant.

Note:

1. This interpretation is implemented not later than 1 July 2016.

TL- I

MPC109

2011 Guidelines Addressing Additional Aspects to the NO_x Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems (Resolution MEPC.198(62), Section 3.2.1.4)

MEPC.198(62), Section 3.2.1.4 reads:

3.2.1 In addition to the information supplied in paragraph 3.1.3 of these guidelines and items in section 2.4 of the NTC 2008, engine systems fitted with SCR should include the following information in its Technical File:

.4 catalyst block specification and arrangement in the SCR chamber;

Interpretation

The engine technical file is to include details of catalyst block specification and the arrangement of catalyst blocks within the SCR chamber, this is to include, but not be limited to:

a) Installation of blocks within the SCR chamber, including the number of blocks, number of layers and sealing arrangements between blocks and SCR chamber casing and frame to prevent exhaust gas slip
b) Catalyst block geometry, including the CPSI (cells per square inch) or metric equivalent
c) Limiting ranges for physical parameters such as the space velocity (SV), area velocity (AV) and linear velocity (LV)
d) Catalyst material, this may be identified by means of a part number or specification number
e) Arrangement of soot blowing equipment
f) Inspection and access arrangements
g) Any baffle plates or other devices installed within the SCR chamber for exhaust gas and reductant flow distribution

The applicant is to provide a means of ensuring that a visual inspection of an SCR block can easily identify it as being of the type in the technical file, this may be by stamping the catalyst block casing with an ID number of the parameter where practical.

Inspection of the SCR chamber should be limited to ensuring that the correct catalyst blocks are fitted during assembly of the SCR. Inspection of spare catalyst blocks can be accepted to demonstrate compliance at surveys other than at the initial assembly of the SCR. This practice recognises the demand for safe working procedures and avoids disassembly of catalyst blocks.

Note:

1. This interpretation is implemented not later than 1 July 2016.

TL- I
MPC110

2011 Guidelines Addressing Additional Aspects to the NO_x Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems (Resolution MEPC.198(62), Section 3.2.1.6)

MEPC.198(62), Section 3.2.1.6 reads:

3.2.1 In addition to the information supplied in paragraph 3.1.3 of these guidelines and items in section 2.4 of the NTC 2008, engine systems fitted with SCR should include the following information in its Technical File:

.6 cross-unit parameters: allowable pressure loss (Δp) between inlet and outlet of SCR chamber and in the exhaust duct caused by SCR components;

Interpretation

Where there are any elements of the SCR system upstream and/or downstream of the SCR chamber which affects the allowable pressure loss then this allowable pressure loss is to be based on the entire SCR system.

Note:

1. This interpretation is implemented not later than 1 July 2016.

TL- I
MPC111

2011 Guidelines Addressing Additional Aspects to the NO_x Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems (Resolution MEPC.198(62), Section 3.2.1.7)

MEPC.198(62), Section 3.2.1.7 reads:

3.2.1 In addition to the information supplied in paragraph 3.1.3 of these guidelines and items in section 2.4 of the NTC 2008, engine systems fitted with SCR should include the following information in its Technical File:

> *.7 aspects related to the fuel oil quality resulting in continued compliance of the engine with the applicable NO_x emission limit;*

Interpretation

The engine technical file is to include details of aspects related to the fuel oil quality resulting in continued compliance of the engine with the applicable NO_x emission limit. This is to include, but not be limited to:

a) The maximum allowable sulphur content of fuel which can be combusted, where applicable
b) Any restrictions applicable to the composition of fuel other than sulphur, such as ash, vanadium, where applicable
c) Guidance on fuel contaminants which may poison active material under operational conditions, such as alkaline metals

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Note:

1. This interpretation is implemented not later than 1 July 2016.

TL- I MPC112 2011 Guidelines Addressing Additional Aspects to the NO_x Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems (Resolution MEPC.198(62), Section 3.2.1.8)

MEPC.198(62), Section 3.2.1.8 reads:

3.2.1 In addition to the information supplied in paragraph 3.1.3 of these guidelines and items in section 2.4 of the NTC 2008, engine systems fitted with SCR should include the following information in its Technical File:

> *.8 factors related to the deterioration rate of SCR performance, e.g., exchange condition for SCR blocks and recommended exchange time of SCR blocks;*

Interpretation

The engine technical file is to include details of factors related to the deterioration rate of SCR performance, e.g., exchange condition for SCR blocks and recommended exchange time of SCR blocks.

Where a feedback reductant control strategy is adopted utilising NO_x monitoring then this is acceptable as a means of monitoring catalyst condition/degradation.

Where a feed forward control reductant control strategy is used then the applicant is to provide details of:

a) The expected deterioration curve under expected operating conditions
b) The life of catalyst under expected operating conditions
c) Factors which can influence catalyst condition
d) Guidance on how to assess catalyst condition and activity by spot checks, if applicable, should be provided. Records are to be kept for inspection during annual survey, intermediate and renewal surveys

SCR systems using a feed forward reductant control strategy may be fitted with NO_x monitoring devices for the purposes of monitoring catalyst condition.

The technical file is to include guidance to assist the crew in recovering from SCR fouling and poisoning mechanisms where recovery from such fouling and poisoning can be achieved without exchanging catalyst blocks or applying specialised re-activation techniques.

Note:

1. This interpretation is implemented not later than 1 July 2016.

TL- I
MPC113

2011 Guidelines Addressing Additional Aspects to the NO_x Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems (Resolution MEPC.198(62), Section 3.2.1.9)

MEPC.198(62), Section 3.2.1.9 reads:

3.2.1 In addition to the information supplied in paragraph 3.1.3 of these guidelines and items in section 2.4 of the NTC 2008, engine systems fitted with SCR should include the following information in its Technical File:

> *.9 controlling arrangements and settings of the SCR, e.g., model, specification of control device;*

Interpretation

The engine technical file is to include details of controlling arrangements and settings of the SCR, e.g. model, specification of control device. This is to include, but not be limited to:

a) Crew guidance for adjusting control parameters, where allowed
b) Analyser zero and span check procedures and the periodicity of such checks, as applicable
c) Analyser calibration gases to be carried on-board as applicable
d) The reductant injection control strategy, whether this is a feed forward reductant injection control or feedback reductant injection control strategy
e) Instrumentation and sensors which form part of the SCR control arrangement, as applicable
f) Details of how access to the system configuration programs and data of programmable logic controllers (PLC) and central processing units (CPU) is restricted to prevent unauthorised alteration, where applicable
g) Gas analysers, as applicable. Where gas analysers are to be used, including for feedback control or for feedforward control, the following details are to be included as a minimum:
    (i) Type/model (identification number)
    (ii) Calibration, zero and span check procedures and the periodicity of such checks
    (iii) Calibration gases to be carried on-board
    (iv) Maintenance and/or exchange requirements

When the combined engine/SCR system has different operating modes, such as separate modes for Tier II and Tier III compliance then the applicant is to include details of the control philosophy for selecting different modes of operation and for recording the mode of operation.

Note:

1. This interpretation is implemented not later than 1 July 2016.

TL- I MPC114 2011 Guidelines Addressing Additional Aspects to the NO_x Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems (Resolution MEPC.198(62), Section 3.2.1.10)

MEPC.198(62), Section 3.2.1.10 reads:

3.2.1 In addition to the information supplied in paragraph 3.1.3 of these guidelines and items in section 2.4 of the NTC 2008, engine systems fitted with SCR should include the following information in its Technical File:

.10 measures to minimize reductant slip;

Interpretation

The engine technical file is to include details of measures to minimize reductant slip. There is no emission limit value for reductant slip in MARPOL Annex VI Regulation 13 or the NO_x Technical Code. In practice this reductant slip is expected to be composed of ammonia which has not reacted on the surface of the catalyst.

In the absence of an emission limit value the applicant is to provide guidance on expected ammonia slip levels and to submit proposals to ensure that the ammonia slip will be minimised. This is to include instruction on when reductant injection should commence since it is recognised that injecting reductant into the SCR chamber before the catalyst blocks have reached their operating temperature (typically 300°C) will result in high ammonia slip. The reductant injection permissive is to consider catalyst operating temperature and is not to be based only on inlet exhaust gas temperature since there will be a period of time between the exhaust gas inlet temperature reaching the required temperature and the catalyst blocks reaching their operating temperature. This may be demonstrated by the applicant supplying a minimum operating temperature downstream of the SCR.

The applicant is to provide details of measures to minimise ammonia slip after the SCR, along with guidance for checking at annual, intermediate and renewal surveys.

When ammonia monitoring is to be fitted to measure ammonia concentration in the exhaust duct downstream of the SCR, or when an equivalent means such monitoring of other gaseous emissions such as NO_x in conjunction with system control reference values can effectively provide a means of monitoring ammonia slip, this will be accepted as the means of checking that measures to minimise ammonia slip are being effectively implemented.

Note:

1. This interpretation is implemented not later than 1 July 2016.

TL- I
MPC115

2011 Guidelines Addressing Additional Aspects to the NO_x Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems (Resolution MEPC.198(62), Section 3.2.1.11)

MEPC.198(62), Section 3.2.1.11 reads:

3.2.1 In addition to the information supplied in paragraph 3.1.3 of these guidelines and items in section 2.4 of the NTC 2008, engine systems fitted with SCR should include the following information in its Technical File:

> *.11 parameter check method as the verification procedure: with regard to the application of the parameter check method, requirements given in paragraph 2.3.6 of the NTC 2008 and guidance given in appendix VII, paragraph 2 of the NTC 2008 should be taken into account in assessing the adequacy of a proposed procedure with analysers meeting or exceeding the requirements of appendix III of the NTC 2008;*

Interpretation

The engine technical file is to include details of the application of the parameter check method, requirements given in paragraph 2.3.6 of the NTC 2008 and guidance given in appendix VII, paragraph 2 of the NTC 2008 should be taken into account in assessing the adequacy of a proposed procedure with analysers meeting or exceeding the requirements of appendix III of the NTC 2008. Other systems or analysers may be accepted if they yield equivalent results, see paragraph 5.4.2 of the NTC 2008.

Where NO_x monitoring is used to demonstrate compliance then measurement of the NO_x reduction rate in accordance with chapter 7 of the guidelines is accepted as demonstrating compliance, analysers are to meet the requirements of appendix III of the NTC 2008.

Spot check may be taken as an on-board measurement of the NO_x reduction rate in accordance with chapter 7 of the guidelines, alternatively, systems using a feed forward reductant control strategy may be fitted with NO_x monitoring devices for the purposes of monitoring catalyst condition and SCR performance. Instrumentation used for spot checks, or alternatively monitoring, is to meet the requirements of Appendix III of the NO_x Technical Code 2008.

Note:

1. This interpretation is implemented ot later than 1 July 2016.

For systems using feed forward reductant controls without NO_x monitoring the applicant is to provide details of the relationship between engine load and reductant consumption and the means of checking that reductant flow is appropriate. The Technical File is to include proposals for maintaining records of reductant consumption and also reductant composition and quality. Records of reductant composition and quality may be based on delivery notes where these delivery notes include reductant concentration and quality parameters.

Reductant delivery notes may also be accepted for the purposes of verifying that the system has been operated using reductant. In such cases the reductant delivery notes are to be made available at annual, intermediate and renewal surveys. Where it is proposed to produce aqueous reductant on-board then the recording system is to consider records of feedstock deliveries and quality.

TL- I MPC116 2011 Guidelines Addressing Additional Aspects to the NO_x Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems (Resolution MEPC.198(62), Section 3.2.1.12)

MEPC.198(62), Section 3.2.1.12 reads:

3.2.1 In addition to the information supplied in paragraph 3.1.3 of these guidelines and items in section 2.4 of the NTC 2008, engine systems fitted with SCR should include the following information in its Technical File:

.12 any other parameter(s) specified by the manufacturer.

Interpretation

The applicant is responsible for ensuring any parameters which affect NO_x emissions and which are not included within the scope of 3.2.1.1 - 3.2.1.11 are included within the Technical File.

Note:

1. This interpretation is implemented not later than 1 July 2016.

TL- I
MPC117

2011 Guidelines Addressing Additional Aspects to the NO_x Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems (Resolution MEPC.198(62), Section 3.5.2)

MEPC.198(62), Section 3.5.2 reads:

3.5.2 When an applicant chooses the Scheme B for pre-certification, the IAPP initial survey should not be completed until the on board initial confirmation test provides compliant results. The applicant remains the responsible entity until final acceptance of the system.

Interpretation

When the first engine to be installed is not the parent engine of the group then a confirmation test is to be carried out to the first engine installed confirming that the measured values demonstrate that the NO_x reduction rate is within the NO_x reduction allowance given in section 7.5 of the guidelines. Subsequent engines installed with a design NO_x emission value not higher than the first engine installed are not required to have a confirmation test. When an engine is installed with a higher design total weighted NO_x emissions value than either the first engine installed, or any subsequent engines which have been subjected to a confirmation test then a confirmation test is required. This does not remove the requirement to carry out the parent engine confirmation test when it is installed on a ship. The applicant is responsible for submitting the design NO_x emission value.

When engine is used in this interpretation then it is to be taken as meaning a combined engine/SCR system which is to be part of an engine group as defined in section 4.1 & 4.4 of the NTC 2008.

The design NO_x emission value when used in this interpretation is to be taken as the NO_x emission values at the outlet from the SCR chamber at each of the mode points for the applicable test cycle, see 3.2 of NTC 2008.

Note:

1. This interpretation is implemented not later than 1 July 2016.

TL- I MPC118 2011 Guidelines Addressing Additional Aspects to the NO_x Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems (Resolution MEPC.198(62), Section 4.1)

MEPC.198(62), Section 4.1 reads:

4.1 Requirements in chapter 4 of the NTC 2008 apply equally to engine systems fitted with SCR.

Interpretation

When Scheme B is applied then the engine group concept may be applied. However the engine family concept is not to be applied, as per section 2.2.4.2 of the NTC 2008.

The parent engine is to be the combined engine/SCR system with the highest NO_x emission value of the group (sections 4.3.9.1 & 4.4.8.1 of the NTC 2008). In cases where there is more than one engine with the same highest NO_x emission value within an engine group then the parent engine is to be the combined engine/SCR system with the lowest NO_x reducing margin of the group, i.e. the combined engine/SCR system with the lowest margin between raw NO_x emitted from the engine and NO_x emitted values at the SCR outlet. This can be expressed as:

NO_x reducing margin = (NO_x at SCR outlet/NO_x, raw emitted from engine) x 100%

When the engine is to be certificated to both Tier II and Tier III then this dual Tier approval is to be issued as a single EIAPPC covering both Tier modes.

When an engine is to be certificated as both a Tier II and as a Tier III engine then the parent engine is to be:

- The combined engine/SCR system with the highest NO_x emissions; or
- Alternatively when NO_x emission values are harmonised across an engine group then the parent engine is to be the combined engine/SCR system with the smallest margin between the NO_x reduction rate required for compliance with regulation 13 of MARPOL Annex VI and the reduction rate that the SCR is capable of achieving for each of the two tiers. In Tier II mode this may be the engine with the highest NO_x emissions without SCR system.

This may mean that the parent engine for Tier II may not be the same parent combined engine/SCR system as for Tier III.

Note:

1. This interpretation is implemented not later than 1 July 2016.

TL- I
MPC120

2011 Guidelines Addressing Additional Aspects to the NO_x Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems (Resolution MEPC.198(62), Section 5.2.2)

MEPC.198(62), Section 5.2.2 reads:

5.2.2 For an engine system fitted with SCR, the following parameters should be measured and recorded in the engine test report in accordance with section 5.10 of the NTC 2008:

.1 injection rate of reductant at each load point (kg/h);

.2 exhaust gas temperature at the inlet and outlet of the SCR chamber (°C);

.3 pressure loss (kPa): it is necessary to measure the pressure at inlet and at outlet of the SCR chamber and to calculate pressure loss Δp. If the manufacturer sets an allowable limit of Δp, it should be confirmed; and

.4 other parameter(s) as specified by the Administration.

Interpretation

The parameters which are to be measured to satisfy paragraph 5.2.2 are additional to those required by Chapter 5 of the NTC 2008.

In the case of a high pressure SCR system, when a SCR system is installed into the high pressure side of the turbine(s), measuring pressure loss using a subtraction calculation in accordance with paragraph 5.2.2.3 of the guidelines is likely to introduce error, because measurement instruments will have to be of a high pressure range type. Therefore it is also allowed to measure the pressure loss of the SCR chamber with a pressure loss sensor instead of calculating the pressure loss from two pressure values measured at the inlet and outlet of the SCR chambers separately.

Note:

1. This interpretation is implemented not later than 1 July 2016.

TL- I
MPC122

2011 Guidelines Addressing Additional Aspects to the NO_x Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems (Resolution MEPC.198(62), Section 6.3.2.1.2)

MEPC.198(62), Section 6.3.2.1.2 reads:

6.3.2.1 Exhaust gas, catalyst, reductant and an injection system should satisfy the following conditions at each mode point:

.2 Exhaust gas component

Exhaust gas for the test should either be diesel engine exhaust gas or simulated gas.

Where diesel exhaust gas is used it should correspond, in terms of concentrations, to the exhaust gas in section 6.2 of these guidelines, in terms of NO_x, O_2, CO_2, H_2O, and SO_2 (±5% of the required concentration for each emission species).

Where simulated gas is used it should correspond, in terms of concentrations, to the exhaust gas in section 6.2 of these guidelines, in terms of NO, NO_2, O_2, CO_2, H_2O, and SO_2 (±5% of the required concentration for each emission species) balance N_2.

Interpretation

When the applicant is able to demonstrate that one or more of the gas species and concentrations provided in 6.3.2.1.2 of the guidelines do not affect the modelling process then an exemption from the applicable concentration requirement for the species may be agreed.

Note:

1. This interpretation is implemented not later than 1 July 2016.

TL- I MPC123 2011 Guidelines Addressing Additional Aspects to the NO_x Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems (Resolution MEPC.198(62), Section 6.3.2.1.5)

MEPC.198(62), Section 6.3.2.1.5 reads:

6.3.2.1 Exhaust gas, catalyst, reductant and an injection system should satisfy the following conditions at each mode point:

.5 Reductant

The reductant concentration should be representative of the reductant concentration in the exhaust gas during actual operation.

Interpretation

The reductant is to be representative of reductant concentration on the surface of the catalyst and not at point of injection into the exhaust gas. For scaled model testing this may mean testing using ammonia gas to represent the reductant.

Note:

1. This interpretation is implemented not later than 1 July 2016.

TL- I MPC125 Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines (NO_x Technical Code 2008, Chapter 4, Paragraph 4.4.6.1)

Paragraph 4.4.6.1, Chapter 4 of NO_x Technical Code (NTC) 2008 reads:

4.4.6.1 The engine group may be defined by basic characteristics and specifications in addition to the parameters defined in 4.3.8 for an engine family.

Interpretation

Paragraph 4.4.6.1 cross references 4.3.8 which provides guidance for selection of an engine family. For engines fitted with SCR system to reduce NO_x emissions it is recognised that some of the parameters provided may not be common to all engines within a group, in particular 4.3.8.2.3 and 4.3.8.2.4 state that:

.3 individual cylinder displacement:

- to be within a total spread of 15%

.4 number of cylinders and cylinder configuration:

- applicable in certain cases only, e.g., in combination with exhaust gas cleaning devices

For engines fitted with SCR system to reduce NO_x emissions the number and arrangement of cylinders may not be common to all members of the engine group. These parameters may be replaced with new parameters derived from the SCR chamber and catalyst blocks, such as the SCR space velocity (SV), catalyst block geometry and catalyst material.

Note:

1. This interpretation is implemented not later than 1 July 2016.

TL- I MPC126 Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines (NO_x Technical Code 2008, Chapter 4, Paragraph 4.4.6.2)

Paragraph 4.4.6.2, Chapter 4 of NO_x Technical Code (NTC) 2008 reads:

4.4.6.2 The following parameters and specifications shall 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 NO_x emission;

.5 design features of the fuel injection system, plunger and injection cam which may profile basic characteristics that effect NO_x emission; and

.6 rated power at rated speed. The permitted ranges of engine power (kW/cylinder) and/or rated speed are to be declared by the manufacturer and approved by the Administration.

Interpretation

For engines fitted with SCR system to reduce NO_x emissions it is recognised that some of the parameters provided may not be common to all engines within a group and that new parameters derived from the SCR chamber and catalyst blocks may be used instead, such as the SCR space velocity (SV), catalyst block geometry and catalyst material.
Whilst the provisions of 4.4.6.2.1 are to remain common to all engines within the group, the remaining parameters listed in 4.4.6.2 may be replaced by alternative SCR parameters provided that the applicant is able to demonstrate that these alternative parameters are suitable for defining the engine group.
The applicant remains responsible for selecting the parent engine and demonstrating the basis of this selection to the satisfaction of the Administration.

Note:

1. This interpretation is implemented not later than 1 July 2016.