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**UNIFIED INTERPRETATION TO PROVISIONS OF IMO ENVIRONMENT-RELATED
CONVENTIONS**

Unified Interpretations relating to the NO_x Technical Code, 2008

Submitted by the International Association of Classification Societies (IACS)

SUMMARY

Executive summary: This document discusses a new IACS Unified Interpretation (MPC130) of paragraph 2.2.5.1 of the NO_x Technical Code 2008 and revised IACS Unified Interpretations MPC33, MPC51 and MPC74, with a view to facilitating the consistent and global implementation of the NO_x Technical Code 2008

Strategic direction, if applicable: 6

Output: 6.1*

Action to be taken: Paragraph 22

Related documents: MEPC 52/4/7; MEPC 53/24; MEPC 71/5/4; PPR 5/24 and PPR 5/WP.6

Introduction

1 The NO_x Technical Code, as amended by resolution MEPC.177(58) (NTC 2008), provides revised mandatory procedures for the testing, survey and certification of marine diesel engine to ensure they comply with the relevant limiting emission values of NO_x as specified in regulation 13 of MARPOL Annex VI.

2 IACS has identified the need to clarify some of the provisions of NTC 2008, in order to facilitate their global and consistent implementation. Consequently, the existing IACS Unified Interpretations (UIs) MPC33, MPC51 and MPC74 have been revised and a new UI (MPC130, relating to paragraph 2.2.5.1 of NTC 2008) has been developed.

* Refers to the list of outputs for the 2018-2019 biennium.

Discussion

Paragraph 2.2.4.1 of the NTC 2008

3 The initial version of IACS UI MPC33 (July 2004) provided an interpretation of paragraph 2.2.4 of the version of the NO_x Technical Code that was applicable at that time. For engines that could not be pre-certified on a test bed, this UI clarified that such engines are to undergo an on-board certification test according to the same procedure as if the engine had been pre-certified on a test bed, in order for the engine to be issued with an EIAPP Certificate.

4 Having considered UI MPC33 that was set out in the annex to document MEPC 52/4/7, MEPC 53 subsequently included this interpretation (together with other unified interpretations) in MEPC.1/Circ.473 (MEPC 53/24, paragraph 4.55.7). It is noted that this initial version of UI MPC33 was subsequently partly included in the text of the NTC 2008.

5 As a consequence of the recent review of UI MPC33, which took into account the text of the NTC 2008, as amended, IACS proceeded with developing a revision of this UI by removing the part of the text that had been introduced in regulation 2.2.4.1 of the NTC 2008, i.e. clauses (a), (b) and (c) of the UI.

6 Clause (d) of the original UI MPC33 has been retained and expanded in the latest revision of this UI, i.e. revision 2 (see annex 1). It is observed that as the results of the parent engine emission test shall always form part of the Technical File, and these results are not available before the onboard certification test, the Technical File cannot be finally approved at this stage of certification. For this reason, the wording "...an approved Technical File" in clause (d) of the original version of UI MPC33 has been changed in Revision 2 to read "...a preliminary approved Technical File, pending the results of the emission test". Also, UI now clarifies instances when an engine is tested on board due to modifications or adjustments outside of the range allowed according to its Technical File, i.e. in instances when the result of the emission test shows that the engine does not comply with the applicable regulation, the engine is either to be re-adjusted to the compliance condition originally approved, if any; or the applicant is to apply to the Administration for acceptance of further testing. Revision 2 of IACS UI MPC33 is set out in annex 1.

Paragraph 2.2.5.1 of the NTC 2008

7 Paragraph 2.2.5.1 of the NTC 2008 requires that when a NO_x reducing device is to be included within the EIAPP certification, the device is to be regarded as a component of the engine and its presence shall be recorded in the engine's Technical File.

8 It is noted that exhaust gas cleaning systems, used for the abatement of sulphur oxides and particulate matters i.e. scrubbers, which are similar to Selective Catalytic Reduction (SCR) systems in that they are installed along the exhaust duct, are certified under regulation 4 of MARPOL Annex VI. However, when an SCR system is used as a NO_x reducing device and it is to be certified together with the engine in one EIAPP, the certification process follows regulation 13 of MARPOL Annex VI and the NTC 2008. Therefore the SCR system cannot be considered as an equivalent arrangement according to regulation 4 of MARPOL Annex VI.

9 To remove any doubt regarding this issue, IACS has developed and adopted UI MPC130 regarding paragraph 2.2.5.1 of the NTC 2008 (see annex 2).

Paragraph 3.2.1 of the NTC 2008

10 IACS considers that clarification is needed with respect to the certification of engines that are intended to operate as part of an Integrated Electric Propulsion (IEP) system, i.e. engines driving an alternator supplying electrical power for both propulsion and auxiliary power. Such arrangements can typically be found on cruise ships. In particular, clarification is needed with respect to testing such engines in accordance with both the D2 and E2 test cycles or with the E2 test cycle only.

11 The NTC 2008 specifies test cycles to be applied for verification of compliance with the applicable NO_x emission limits as specified in regulation 13 of MARPOL Annex VI. Paragraph 3.2.1 of the NTC 2008 requires that one or more of the relevant test cycles specified in paragraphs 3.2.2 to 3.2.6 of the Code shall be applied.

12 For engines in diesel-electric propulsion applications two test cycles may be considered:

- .1 test cycle E2: test cycle for "Constant-speed main propulsion" application (including diesel-electric drive and all controllable-pitch propeller installations); and
- .2 test cycle D2: test cycle for "Constant-speed auxiliary engine" application.

13 The main difference between the E2 and D2 test cycles is the consideration of low engine loads (10% load point) in the D2 cycle. For engines operating in an IEP system, controlled by a power management system, it can be expected that such engines will not operate at low loads below 25% for a significant time period. Therefore, for these engines the E2 test cycle should be considered as the most appropriate test cycle and should be the only cycle applied.

14 Revision 1 of UI MPC51 was submitted in the annex to document MEPC 71/5/4. The Committee agreed to refer consideration of this UI to PPR 5. Following consideration in the Air Pollution Working Group at PPR 5, the Sub-Committee, having considered the relevant parts of the report of the Working Group (PPR 5/WP.6, paragraphs 47 to 48), noted that, due to a lack of sufficient support by Member Governments, the Group agreed not to develop a UI on engine test cycles as required by the NO_x Technical Code 2008 (PPR 5/24, paragraph 20.5). IACS subsequently withdrew Revision 1 of UI MPC51 prior to its expected implementation date of 1 July 2018; carefully reviewed the comments made at PPR 5 on this issue and updated this UI (see annex 3).

Paragraph 5.10.1 of the NTC 2008

15 IACS developed UI MPC 74 (July 2004) regarding paragraph 5.10.1 of the NO_x Technical Code that was applicable at that time. This UI has been uniformly implemented by IACS Members from 19 May 2005.

16 This UI outlines the necessary data that is to be recorded during the emission test to fully define the engine performance, taking account of section 1 of appendix 5 of the NTC 2008.

17 Where engines are fitted with a SCR system, as indicated in paragraphs 5.2.2 and 6.2.2 of the *2017 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.291(71)), more parameters are to be recorded accordingly, which are beyond those in section 1 of appendix 5 of the NTC 2008.

18 For dual-fuel engines, the ratio of liquid-to-gas, gas fuel temperature and its measurement point position is to be recorded as required in paragraphs 5.3.5 and 5.3.6 of the NTC 2008.

19 Additional parameters supporting the test fuel categorization according to ISO 8217:2017 on "Petroleum products — Fuels (class F) — Specifications of marine fuels" are to be indicated in the emission test report.

20 Based on the above considerations, IACS has developed and adopted revision 1 of UI MPC74 (see annex 4).

IACS Unified Interpretations implementation provisions

21 The Sub-Committee is invited to note that IACS Members intend to implement the new UI MPC130 and the latest revisions of UIs MPC33, MPC51 and MPC74 from 1 July 2020, unless they are provided with written instructions to apply a different interpretation by the Administration on whose behalf they are authorized to act as a recognized organization.

Action requested of the Sub-Committee

22 The Sub-Committee is invited to:

- .1 consider the comments provided in paragraphs 3 to 20, above, and IACS UIs as set out in the annexes;
- .2 consider preparing a new draft MEPC circular to reflect the annexed new and revised unified interpretations, if found acceptable; and
- .3 take action as appropriate.

ANNEX 1

MPC
33
(July
2004)
(Rev.
1
Mar
2006)

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

(NO_x Technical Code 2008, Chapter 2, Paragraph 2.2.4.1)

Chapter 2.2.4

Chapter 2.2 Procedures for pre-certification of an Engine Group

Chapter 2.2.4 reads as follows:

Paragraph 2.2.4.1, Chapter 2 of the NO_x Technical Code (NTC) 2008 reads:

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~~ shipbuilder shall make application to the Administration requesting an ~~on-board~~ onboard test (see 2.1.2.2). The applicant must demonstrate to the Administration that the ~~on-board~~ onboard 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 out on board a ship without any valid pre-certification test. For engines undergoing an on-board certification test, in order to be issued with an EIAPP Certificate, the same procedures apply as if the engine had been pre-certified on a test-bed, subject to the limitations given in paragraph 2.2.4.2.

Note

1. This UI is to be uniformly implemented by IACS Societies from 19 May 2005.
2. Revision 1 of this UI is to be uniformly implemented by IACS Societies from 1 July 2006.
3. Revision 2 of this UI is to be uniformly implemented by IACS Societies from 1 July 2020.

Interpretation

~~For engines 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: shall have a preliminary approved Technical File, pending the results of the emission test.~~

~~If the result of the emission test does not comply with the applicable NO_x regulation, the engines are to be re-adjusted to the compliance condition originally approved, if any, or the applicant is to apply to the flag Administration for acceptance of further testing.~~

- ~~(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)~~

ANNEX 2

MPC 130 Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines

(Nov 2019)

(NO_x Technical Code 2008, Chapter 2, Paragraph 2.2.5.1)

Paragraph 2.2.5.1, Chapter 2 of the NO_x Technical Code (NTC) 2008 reads:

2.2.5.1 Where a NO_x-reducing device is to be included within the EIAPP certification, it must be recognized as a component of the engine, and its presence shall be recorded in the engine's Technical File.

Interpretation

For the purpose of the first sentence of regulation 2.2.5.1 of the NO_x Technical Code 2008, a NO_x-reducing device (e.g. SCR) is recognized as a component of the engine and as such the SCR will not be covered by MARPOL Annex VI, regulation 4 - Equivalent.

Note

1. This Unified Interpretation is to be uniformly implemented by IACS Societies from 1 July 2020.

ANNEX 3

MPC 51 ~~Resolution 2 of the 1997 MARPOL Conference~~
Technical Code on Control of Emission of
Nitrogen Oxides from Marine Diesel Engines

(July 2004)
(Rev.1
Jan 2017
Withdrawn)
(Rev.2
Nov 2019)

(NO_x Technical Code 2008, Chapter 3, Paragraph 3.2.1)

Chapter 3.2.1

~~Chapter 3.2 Test cycles and weighting factors to be applied~~

~~Chapter 3.2.1 reads as follows:~~

Paragraph 3.2.1, Chapter 3 of the NO_x Technical Code (NTC) 2008 reads:

~~3.2.1 For every Individual engine Engine or parent Parent engine Engine of an engine group or family Engine Family or Engine Group, one or more of the relevant test cycles specified in 3.2.2 to 3.2.6 shall be applied for verification of compliance with the applicable NO_x emission limits in accordance with contained in 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. For a parent engine of an engine family or engine group, one or more test cycles shall be applied where an engine family or engine group contains engine models which can be used solely for one application and engine models which can be used for another application.~~
- (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. Individual engines or member engines of an engine family or engine group intended to be used for more than one application are to be certified for the relevant test cycles.~~

Note

1. This UI is to be uniformly implemented by IACS Societies from 19 May 2005.
2. Rev.1 of this UI was withdrawn prior to coming into force on 1 July 2018.
3. Rev.2 of this UI is to be uniformly implemented by IACS Societies when an application for certification of an engine is dated on or after 1 July 2020.

(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. For those instances where an engine is installed in an integrated propulsion system and is used simultaneously or separately for supplying energy to main propulsion and for auxiliary purposes, and where the distribution of power on board is controlled by a power management system, that engine is to be certified to the test cycle only which represents the main purpose of this engine application. In such cases, main propulsion is considered to be the main purpose of this application and takes precedence, meaning that E2 certification only is required for these engines.~~

(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.~~

* This Underlined Rev.2 contains the changes with respect to July 2004 version.

ANNEX 4

**MPC
74**

(July 2004)
(Rev.1
Nov 2019)

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

(NO_x Technical Code 2008, Chapter 5, Paragraph 5.10.1)

Chapter 5.10.1

Chapter 5.10 Test report

Chapter 5.10.1 reads as follows:

Paragraph 5.10.1, Chapter 5 of the NO_x Technical Code (NTC) 2008 reads:

5.10.1 For every engine Individual Engine or Parent Engine tested for pre-certification or for initial certification on board without precertification, to establish an Engine Family or Engine Group, the engine manufacturer shall prepare a test report which shall contain ; as a minimum, the necessary data to fully define the engine performance and enable calculation of the gaseous emissions including the data as set out in section 1 of 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~~ The "necessary data to fully define the engine performance and enable calculation of the gaseous emissions" shall be incorporated, in accordance with 5.12, from the raw data units to the cycle weighted 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) relevant to the approval of a specific engine design and/or on-board NO_x verification procedures must also be given. For the engine fitted with SCR, under scheme A, the parameters listed in sub-paragraphs of paragraph 5.2.2 of IMO resolution MEPC. 291(71) shall be measured and recorded in the engine test report. Under scheme B, the exhaust gas temperature at the intended inlet of the SCR chamber shall be determined and recorded in the test report. For Dual fuel engines, the ratio of liquid-to-gas, Gas fuel temperature and its measurement point position shall be recorded during the testing.

Note

1. This UI is to be uniformly implemented by IACS Societies from 19 May 2005.
2. Rev. 1 of this UI is to be uniformly implemented by IACS Societies from 1 July 2020.

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 analyzer calibration and not the deviation of the span gas concentration.

- b) The "~~fuel~~ 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 8217:2017 grade (i.e. DMA, DMB or DMC etc.) as given on EIAPP Certificate Supplement 4.12-1.9.4 ~~and hence as a minimum shall give the~~ by considering other additional 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). for the fuel oil characteristics, i.e. Cetane index (ISO 4264:2018), carbon residue (ISO 10370:2014).