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UNIFIED INTERPRETATION OF PROVISIONS OF IMO ENVIRONMENT-RELATED CONVENTIONS

Proposed interpretation of the NO_x Technical Code 2008

Submitted by IACS

SUMMARY

Executive summary: This document proposes a new interpretation of paragraph 4.4.6.1 of chapter 4 of the Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines (NO_x Technical Code 2008) (hereinafter referred to as "NTC 2008")

*Strategic direction, 7
if applicable:*

Output: 7.1

Action to be taken: Paragraph 9

Related document: MEPC.1/Circ.895

Background

1 Paragraph 4.3.8.1 of chapter 4 of the NTC 2008 states:

"4.3.8.1 The Engine Family shall be defined by basic characteristics which must be common to all engines within the Engine Family. In some cases there may be interaction of parameters; these effects must also be taken into consideration to ensure that only engines with similar exhaust emission characteristics are included within an Engine Family, e.g. the number of cylinders may become a relevant parameter on some engines due to the charge air or fuel system used, but with other designs, exhaust emissions characteristics may be independent of the number of cylinders or configuration."

2 Paragraph 4.3.8.2.4 of chapter 4 of the NTC 2008 stipulates that the number of cylinders and cylinder configuration are to be common within an engine family in cases where engines are in combination with exhaust gas cleaning devices, as follows:

"4.3.8.2 The engine manufacturer is responsible for selecting those engines from their different models of engines that are to be included in an Engine Family. The following basic characteristics, but not specifications, shall be common among all engines within an Engine Family:

...

.4

number of cylinders and cylinder configuration:

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

3 Paragraph 4.4.6.1 of chapter 4 of the NTC 2008 states:

"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."

4 IACS unified interpretation (UI) MPC125 clarifies that the number of cylinders for engines, which are equipped with SCR in engine group, does not necessarily have to be the same; that interpretation was captured in paragraph 2.2 of the annex to circular MEPC.1/Circ.895.

5 On the other hand, due to the recent diversification of engines in consideration of NO_x emission control, member engines with different numbers of cylinders are being manufactured despite being categorized as engines in one Engine Family.

Discussion

6 IACS considers that, in accordance with paragraph 4.3.8.2.4 of chapter 4 of the NTC 2008, the number of cylinders is to be common within the Engine Family of a SCR-fitted engine. With that in mind, IACS UI MPC125 intentionally established the interpretation of the paragraph which stipulates requirements for the definition of the "Engine Group", i.e. paragraph 4.4.6.1, not paragraph 4.3.8, of chapter 4 of the NTC 2008. The same interpretation is not intended to be applied to the "Engine Family".

7 In the meantime, based on paragraph 4.3.8.1 of chapter 4 of the NTC 2008, IACS considers that it is possible to include different cylinder numbers within an Engine Family with SCR, if the engine manufacturer has provided clear evidence that the number of cylinders has no negative impact on the NO_x emissions. In addition, at the point of the evaluation for NO_x emissions, IACS considers that it is not necessary to distinguish "Engine Family" from "Engine Group" when applying the UI MPC125.

8 On the basis of the discussion in paragraphs 6 and 7 above, IACS proposes the modifications to circular MEPC.1/Circ.895 contained in the annex to this document, for the consideration of the Sub-Committee.

Action requested of the Sub-Committee

9 The Sub-Committee is invited to consider the information contained in this document, in particular the proposed draft revision of the interpretation of paragraph 4.4.6.1 of the NO_x Technical Code as provided in the annex, and take action as appropriate.

ANNEX

DRAFT REVISION OF ANNEX OF MEPC.1/Circ.895*

"UNIFIED INTERPRETATIONS TO THE NO_x TECHNICAL CODE 2008, AS AMENDED

Chapter 4 – Approval for serially manufactured engines: engine family and engine group concept

2 Paragraph 4.4.6.1 of the NO_x Technical Code reads as follows:

"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:

2.1 Paragraph 4.4.6.1 cross-references paragraph 4.3.8 which provides guidance for selection of an Engine Family. For engines fitted with a selective catalytic reduction (SCR) system to reduce NO_x emissions, it is recognized that some of the parameters provided may not be common to all engines within a group, in particular paragraphs 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"

2.2 For engines fitted with an 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.

2.3 This interpretation should in general not be applied to the Engine Family, except where the applicant has provided clear evidence that an Engine Family concept, allowing for different numbers and arrangements of cylinders, will result in same or lower NO_x emissions of the engines with different cylinder numbers compared to the NO_x emissions of the related parent engine.

..."

* Tracked changes are indicated using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.