

SUB-COMMITTEE ON POLLUTION
PREVENTION AND RESPONSE
5th session
Agenda item 20

PPR 5/20/1
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**UNIFIED INTERPRETATION TO PROVISIONS OF IMO
ENVIROMENT-RELATED CONVENTIONS**

**Comments on proposed unified interpretation on engine test cycles
required by the NO_x Technical Code 2008**

Submitted by IMarEST

SUMMARY

Executive summary: Comment is given on document MEPC 71/5/4, as referred to PPR 5, which introduces a revised version of the existing IACS UI MPC 51. While the proposed revision could be supported in respect of a marine diesel engine installed as part of an integrated electric propulsion system it is noted that the text of the revised IACS UI is considerably wider in scope. In the first part of subparagraph (c) of that UI there is only reference to the "main purpose" of the engine, however that may be defined. In the second part of that subparagraph the position of the existing IACS UI is reversed and instead now gives that for an engine which may also independently provide power to auxiliary systems should only be certified for its propulsion duty and hence when operating in an auxiliary role would not be subject to the same level of control as it would be if it was a dedicated engine.

Strategic direction: Number to be assigned after A 30

High-level action: Number to be assigned after A 30

Output: Number to be assigned after A 30

Action to be taken: Paragraph 14

Related documents: MEPC 71/5/4 and MEPC 53/24

Introduction

1 This document comments on document MEPC 71/5/4 as referred by MEPC 71 to PPR 5 for consideration.

Background

2 It is noted that the UI introduced by document MEPC 71/5/4 is a revision of an existing IACS UI, rather than a UI in respect of a newly identified issue. However, the nature of that revision is not given in the submitted document. In effect this revision appears to be a reversal of an IACS UI which has existed since 2004, is the currently applicable IACS interpretation and is that which will remain applicable until 1 July 2018.

3 Under the current MPC 51 – subparagraph (d) it is given that:

"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 the D2 cycles."

4 In document MEPC 71/5/4, the discussion makes the case that, for an engine installed as part of an integrated electric propulsion (IEP) system, henceforth only the E2 cycle should be applied.

Discussion

5 If now the outcome is to introduce an additional engine arrangement to those currently given in chapter 3 of the NO_x Technical Code 2008 (NTC), rather than to apply what has been already given in the most appropriate manner, then it could be supported that the E2 cycle, with 50% of the weighting at the 75% power mode point, could indeed be seen as the most appropriate to IEP systems given their typical manner of engine management as described in the IACS discussion.

6 However, the actual text of the revised UI as now presented makes no reference to IEP systems. Instead in the first part of subparagraph (c) of the revised UI it simply refers to "... only to the test cycle which represents the main purpose of the engine application...". Given that an engine's NO_x certification is typically completed at the engine builder's works while the "... main purpose ...", over the life of that engine will be a function of how, the future shipowner(s) actually use that engine, at a particular time, in a particular trade or other situation specific drivers – all of which may change over time. This also raises the issue of what metric would be used to assess that "... main purpose ...". Would that be running hours, kWh or some other parameter and over what period of time – a day/week/month/year or per voyage/charter/etc.? Hence it is unclear how this certification before the delivery of the engine to the shipyard for installation and its eventual usage are to be aligned since it would appear to require a detailed fore-knowledge of the actual future in service application of that engine. Additionally, there is the concern that if that usage changes, or the initial assumption proves not to be the case, then recertification of that engine would be required noting the significant, if not – in practical terms – insurmountable, problems associated with the testing of an already installed engine in accordance with chapter 5 of NTC.

7 To date, it is understood from the existing IACS UI, and from subparagraph (b) of the revised UI, that each marine diesel engine should be certified from the outset for all the applications for which it is to be used or for which it could be used in the future. An important function of the IAPP initial survey is not to simply copy the certified test cycles as given by the EIAPP Certificate into paragraph 2.2 of the IAPP Supplement but to verify that a particular engine's EIAPP certification is in fact appropriate to the intended use of that engine as installed on board – and at subsequent surveys that there have been no changes which affect that applicability.

8 However, in the second part of subparagraph (c) it is given that when an engine is used as a propulsion engine then that sets the single test cycle for which it is to be certified. This would be irrespective of any other uses, i.e. in port and hence totally independent of its propulsion role, to which that engine may also be used and the proportion that such usage may in fact represent. Furthermore, whereas in IEP systems there are multiple engines which will be run-up/shut-down in order to maintain loads typically above 50% MCR, this would not necessarily be the case for all running engines as covered by the revised UI. For example, for a ship with a single propulsion engine arrangement when in port, or when not underway, if that engine is then used to drive electrical alternators, cargo pumps etc. that could be at potentially relatively low loads compared to that when used for propulsion. Noting that the D2 and C1 cycles put more weighting across the load range, particularly at the mid/lower loads than the propulsion E2/E3 cycles. Consequently, in such a case this potentially results in a multi-purpose engine certified only to E2 being so adjusted that it could not be certified to either D2 or C1, whichever being appropriate to its in port or non-propulsion duties, although it is used in such applications.

9 Additionally, if a single test cycle was to be applied there would appear to be no controls on how that engine would be operated in terms of NO_x control other than when used as a propulsion engine. This is a general point but when considering Tier III engines there is, for example, the SCR as one of the NO_x control device options which may be applied in order to achieve the required NO_x levels. Should this UI as now presented be followed, there would be no NTC review or approval of essential NO_x performance critical aspects such as the reductant injection rates when operating other than as a propulsion engine. Similarly for electronically controlled engines, the fuel injection and other NO_x critical settings to be applied in any role other than propulsion would then be equally outside the scope of that NTC approval process.

10 From the foregoing discussion it would be seen that to set the test cycle requirement to "...main use ..." only, however assessed at a particular time, or to the propulsion function only, irrespective of the other independent in service applications of that engine, would appear to allow for periods of uncontrolled and uncertified usage. Consequently, in taking this matter forward it would be seen that this should only be in respect of marine diesel engines installed as part of an IEP system.

Application of the E2 cycle only in respect of the NO_x Technical Code 2008 certification of marine diesel engines installed as part of an integrated electrical propulsion (IEP) system

11 It is noted that this UI is presented in the usual manner of IACS UIs with no proposal as to the outcome. Recalling that when the current MPC 51 was submitted to MEPC 52 (MEPC 52/4/7) the outcome, following its consideration at DE 48, at MEPC 53 was that it was one of those UIs which the Committee decided that, as given by the report of that meeting (MEPC 53/24, paragraph 4.55.7), represented an amendment to the text of MARPOL Annex VI and hence the Committee included it in the general revision of MARPOL Annex VI (and the NO_x Technical Code) as concluded in 2008. The outcome of that general revision as regards this particular point was that paragraph 3.2.1 of the NO_x Technical Code was amended from the original "... one of the test cycles ..." to read "...one or more of the relevant test cycles...".

12 As discussed in paragraph 5, if the outcome now is to add a new engine arrangement to those given in the headings of the tables in chapter 3 of the NTC (and as repeated as appendix II of MARPOL Annex VI) – then it would be supported that IEP systems could be added to the listing given for table 1. Noting that the current listing gives, in relation to the point in question, "... diesel-electric drive ...", with the emphasis on the word drive (i.e. propulsion) not arrangements. Such an addition is seen as essential since the main title of table 1 is

"Constant speed main propulsion" in order to avoid issues at, for example, port State control inspections as to whether a particular marine diesel engine, in port acting in a role other than main propulsion, is correctly certified in accordance with the NTC requirements. In adding that application to table 1 the definition of an IEP system may also be usefully added to paragraph 1.3 (definitions) of the NTC.

13 A final point on this issue is the application date of the UI as it stands – it is given that it is to be uniformly implemented in respect of applications received on or after 1 July 2018 – the existing requirements being applicable through to that date. However, it is unclear how that would be applied to NTC certification, under which there are certain regulatory dates that form part of the official record, the Parent Engine test date, the certification date of the Engine Group/Engine Family or, for specific engines, their pre-certification survey date or the date of issue of the respective EIAPP Certificate. If the NTC was to be so amended as supported in paragraphs 5 and 12, it would need to be made clear that such a change will be applicable to an Engine Group/Engine Family approved on or after the entry into force of that amendment.

Action requested of the Sub-Committee

14 The Sub-Committee is invited to note the information provided and the proposals made in paragraphs 5, 12 and 13 and take actions as appropriate.
