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**GUIDANCE ON THE APPLICATION OF REGULATION 13 OF MARPOL ANNEX VI
TIER III REQUIREMENTS TO DUAL FUEL AND GAS-FUELLED ENGINES**

1 The Marine Environment Protection Committee, at its sixty-eighth session (11 to 15 May 2015), recognizing the need for uniform application of regulation 13 of MARPOL Annex VI Tier III requirements to dual fuel and gas-fuelled engines, approved the *Guidance on the application of regulation 13 of MARPOL Annex VI Tier III requirements to dual fuel and gas-fuelled engines*, as set out in the annex.

2 Member Governments are invited to bring the annexed guidance to the attention of Administrations, industry, relevant shipping organizations, shipping companies and other stakeholders concerned.

3 Member Governments and international organizations are also invited to provide information on the outcome and experience gained in applying the guidance to a future session of the Committee.

ANNEX

GUIDANCE ON THE APPLICATION OF REGULATION 13 OF MARPOL ANNEX VI TIER III REQUIREMENTS TO DUAL FUEL AND GAS-FUELLED ENGINES

1 The NO_x certification requirements of regulation 13 of MARPOL Annex VI include dual fuel engines (those which can simultaneously use both liquid and gas fuels). MEPC 66 adopted amendments to the NO_x Technical Code 2008 in order to specifically cover certain specific aspects related to the NO_x certification of those engines.

2 MEPC 67 adopted amendments to MARPOL Annex VI which extend the scope of the definition of a marine diesel engine as given by regulation 2.14 to include gas-fuelled engines installed on ships constructed on or after 1 March 2016 and also such engines installed as additional or non-identical replacement engines on or after that date. PPR 2 considered further amendments to the NO_x Technical Code 2008 relating to the certification of gas-fuelled engines which were subsequently approved by MEPC 68. As such, these steps may be seen as complementary to the *International Code of Safety for Ships using Gases or other Low-flashpoint Fuels (IGF Code)*, adopted by MSC 95 in June 2015 (resolution MSC.391(95)).

3 Therefore, the procedures for the certification of engines which use gas as a fuel, typically natural gas, but also other gases, have now been finalized.

4 Gas-fuelled engines, where ignition is initiated by a spark plug or another external ignition device, are generally expected to readily meet the Tier III NO_x emission limits and therefore it is possible that engine builders will seek only Tier III certification for such engines, irrespective of whether they are to be installed on ships which operate outside or inside Emission Control Areas (ECA) for NO_x as described in regulation 13.6 of MARPOL Annex VI, currently the North American ECA and the United States Caribbean Sea ECA, both of which will take effect from 1 January 2016.

5 In the case of dual fuel engines, those engines which use gas fuel in a pre-mix combustion process with the liquid fuel as the pilot ignition source (as opposed to gas-diesel engines which use high pressure gas injection directly into the combustion chamber) are expected to be certified to the Tier III NO_x standards when operating in that arrangement. Consequently, the Technical Files for such engines will include the restriction that, when operating in the Tier III condition, the liquid fuel rate will be limited to the certified maximum liquid pilot fuel rate and those engines will undergo their Tier III Parent Engine test on that basis.¹ These engines are expected to be certified to the Tier II NO_x standards when operating on liquid fuel oil only. In these cases, the EIAPP Certificate would be completed for both Tier II (liquid fuel only) and Tier III (gas fuel with pilot fuel), with a single Technical File giving two different modes of operation.

6 In terms of the applied Onboard NO_x Verification Procedure, virtually all engines use the Parameter Check Method. In this, the Technical Files will provide that all replacements and adjustments to the listed components and settings which affect NO_x emissions are to be recorded in a Record Book of Engine Parameters. This is also the case for engines certified to both Tier II and Tier III, with replacements and adjustments for both operating conditions being listed. In addition, amendments to regulation 13 of MARPOL Annex VI approved at MEPC 68 also require that the tier and on/off status of an engine certified to both Tier II and Tier III or only Tier II on ships subject to regulation 13.5.1 of MARPOL Annex VI should be recorded

¹ The sulphur limit of the fuel used in these engines, in Tier II and Tier III configuration, is subject to MARPOL Annex VI regulation 14 requirements regardless.

together with the date, time and ship's position at entry into and exit from an ECA under regulation 13.6 of MARPOL Annex VI or when the on/off status changes within such designated area. It should be noted that prior to entry into an ECA, sufficient time must be allowed for the tier changeover, to ensure Tier III compliance upon entry into the ECA, and the Technical File should include a written procedure showing how the tier change-over is to be done. The ship must also log the fuel oil change-over as required under regulation 14.6 of MARPOL Annex VI.

7 NO_x emissions during operation on pure liquid fuel resulting from restricted gas supply in cases of failure under paragraph 1.3.10 of the NO_x Technical Code 2008 should follow regulation 3.1.2 of MARPOL Annex VI. This would indicate that if such failure prevents operation on gas fuel, the ship should take reasonable precautions to minimize emissions by operating at Tier II NO_x levels, if feasible. It should be noted that non-availability of gas fuel under regulation 18 of MARPOL Annex VI is not regarded as a failure in this provision.

8 A particular issue for gas or dual fuel engines, including those engines on gas tankers where boil-off from the cargo tanks is the only source of gas fuel on board, is the situation immediately following building, before or after dry docking, or when repairs or maintenance are done on board the ship, when a ship is required to not have gas fuel or gas cargo on board due to safety requirements. In these particular situations, a coastal/port State would have discretion with respect to how the ship would proceed through the ECA. For example, the coastal/port State may allow the ship to proceed to and/or from the dry dock or repair or maintenance location or from the shipyard using liquid fuel, without associated Tier III NO_x controls, provided the fuel is SO_x ECA-compliant or, alternatively, it may specify some other conditions for that limited voyage.

9 It is possible that certain auxiliary control devices (ACD), as mentioned in regulation 13.9 and defined in regulation 2.4 of MARPOL Annex VI, respectively, may be used on dual fuel and gas-fuelled engines, covering starting and stopping, low load operation and manoeuvring and reversing operation. During this type of operation, the amount of liquid fuel used may exceed the maximum amount that the engine was operated on when certified to the test cycles in appendix II of MARPOL Annex VI, resulting in higher NO_x emissions. These ACDs should be disclosed at the time of Tier III certification and denoted in the engine's Technical File.