INTERNATIONAL MARITIME ORGANIZATION

IMO

E

MARINE ENVIRONMENT PROTECTION COMMITTEE
57th session
Agenda item 4

MEPC 57/4/41
22 February 2008
Original: ENGLISH

PREVENTION OF AIR POLLUTION FROM SHIPS

Revisions to Simplify the Emission Upgrade Kit Approach for Existing Engines

Submitted by the United States

SUMMARY

Executive summary:	This document proposes revisions to simplify the draft amendments to regulation 13 of Annex VI to control NOx emissions from certain marine diesel engines built between 1990 and 1999 that have not undergone a major modification since 1 January 2000. These revisions are proposed to simplify the kit approach contained in Option 2, which is based on the certification of emissions upgrade kits that will achieve the regulation 13 NOx limits.
Strategic direction:	7.3
High-level action:	7.3.1
Planned output:	7.3.1.1
Action to be taken:	Paragraph 13
Related documents:	BLG 11/5/15, BLG 11/5/27; BLG 12/6/4, BLG 12/6/24, BLG 12/WP.6 and MEPC 57/4/23

1 This document provides comments on document MEPC 57/4/23 and is submitted in accordance with paragraph 4.10.5 of the Committees' Guidelines (MSC-MEPC.1/Circ.1) and the relaxed deadline for comments documents on the air pollution item to MEPC 57 with prior authorization of the MEPC Chairman following consultations with the Secretariat in line with paragraph 4.12 of the Committees' Guidelines.

2 At the second intersessional meeting of the BLG Air Pollution Working Group held in Berlin and at the most recent session of the BLG Sub-Committee, emission standards for existing engines were the subject of extensive discussion. During these discussions concerns were raised about those cases where retrofit of certain engines is not practical. Recognizing the desire to keep an existing engine program simple and practical, the United States proposed that standards for pre-2000 engines would apply only to engines for which commercial retrofit "kits" have been

certified. Following these discussions, two options for controls for existing engines were included in the draft amendments to Annex VI, regulation 13. Option 1 would apply the current Annex VI NOx limits to each diesel engine installed on a ship constructed on or after 1 January 1990 and prior to 1 January 2000; for those ships that cannot comply with the Tier 1 standards, a port State may require a ship to use distillate fuel or may deny entry into its ports or offshore terminals. Option 2 reflects the "kit" approach and would apply the current Annex VI NOx limits to large-bore engines for which an emissions upgrade kit has been certified. If no kit has been certified there is no requirement.

3 BLG 12 developed draft language for implementation of Option 2 that is set out in the amended text for MARPOL Annex VI (annex 1 to MEPC 57/4/23). However, many delegations, including the United States, felt that this Option, as drafted, was too complicated to be practical for simple application. Consequently, the United States is proposing a revised and simplified text as set out in annex to this document.

The need for additional NOx reductions from existing engines

4 Unlike the fuel sulphur controls under consideration by the Committee, which will have immediate emission benefits from all vessels when they go into effect, the emission benefits of the NOx controls are dependent on the turnover of the fleet to new Tier II and Tier III engines. Vessels built before the effective dates of the new standards, particularly those built before the effective date of the Tier I standards, will continue to emit at higher levels until they are retired.

5 As recognized by the Organization, emissions from ships are of growing concern in many areas of the world. In the United States more than 30 large coastal ports are located in areas that did not achieve the US National Ambient Air Quality Standards for ozone in 2006. In Canada, recent estimates suggest that the share of ships' contribution to total NOx is increasing. A growing number of European and Asian States are also becoming concerned about NOx emissions from ships, both for their contribution to ambient ozone levels and their contribution to the formation of particulate matter emissions (see BLG 11/5/27). For many countries with high ship emissions, an expedient way to obtain early NOx reductions would be through emission controls on engines installed on ships that were built before the Annex VI NOx limits took effect.

A "Kit-Approach" for selected existing engines

6 The revised kit approach contained in the annex to this document specifies that if an emission upgrade kit has been certified by an Administration, that kit must be installed on the relevant engine models prior to the next intermediate or renewal survey that occurs 12 months or more after such a kit is certified. If no emission upgrade kit has been certified for an engine, then there is no requirement for that specific engine model.

7 Under this simplified approach, a kit may be certified by any Administration, including the Administration of the country in which an engine designer or an engine designer's licensee is located. Emission upgrade kits would be certified based on criteria as specified in the Annex.[1] These certification criteria would include, but would not be limited to:

.1 specification of emission test and measurement methods for onboard and/or test bed testing of emission upgrade kit for the purpose of certifying the kit;

[1] The criteria could be included in the NOx Technical Code (NTC) in the new Chapter 7 "New Certification of Existing Engines" or as specific criteria to be included under the Annex, as deemed appropriate.

.2 specification of test fuel properties and any relevant correction factors;

.3 methodology for comparing the measured test emissions with the Tier I emission limits;

.4 procedures to specify the baseline engine configuration both for the purpose of baseline emission measurement for certification testing and for installation of the emission upgrade kit;

.5 procedures to verify that a kit has been installed and is operating;

.6 requirement that the designer of the base engine to which the kit would apply attest that the kit will not decrease engine rating by more than 1.00%, increase fuel consumption by more than 2.00%, or adversely affect engine durability or reliability;

.7 requirement that the cost of an upgrade kit shall not exceed […]; and

.8 any other relevant criteria.

8 Once an Administration has certified an emission upgrade kit based on the criteria developed by the Organization, the Administration shall notify the Organization that a kit has been certified for specific engine models. Application of the requirement would begin 12 months after the deposit of that notification; compliance for any particular vessel would be required prior to the next intermediate or renewal survey after that.

9 The quality of emission upgrade kits would be ensured by the certification criteria described in paragraph 6, and no additional emission testing of an engine equipped with a certified emission upgrade kit would be required. Because the certification of an emission upgrade kit will require the participation of an Administration and the engine designer, this program is expected to result in reliable kits that will achieve the desired emission reductions. The kit approach is also expected to reduce the number of kits and promote harmonization of kits for a particular engine model.

10 Finally, to encourage competition, this approach allows the certification of multiple kits for the same engine model. This will encourage engine designers and/or licensees to refine and modify their kits to improve their emission reductions. It will also help ensure provision of the lowest cost kits. The requirements will be triggered by the first kit to be certified; a ship owner with engines subject to a certified kit may use an alternative certified kit at his discretion.

11 Discussion at BLG 12 reflected two alternative different approaches to defining what specific engines should be covered by the programme. Following discussion with a number of interested parties, the United States believes that a suitable resolution of this issue may be achieved through application of the kit approach to “engines with a power output at or above 5,000 kW.”

12 The NOx emission limit for pre-2000 engines should be the Tier I NOx limits. However, a kit may be certified that achieves greater reductions as long as that kit meets the criteria specified in the Annex.

Action requested of the Committee

13 The Committee is invited to consider the information noted above as well as the proposed amendments to regulation 13, as set out in annex to this document and take action as appropriate.

***

ANNEX

PROPOSED AMENDMENTS TO ANNEX VI, REGULATION 13, PARAGRAPH (7), ALTERNATIVE LANGUAGE FOR OPTION 2 – EXISTING ENGINES

Regulation 13

(7)

a) A diesel engine with a power output of more than 5,000 kW installed on a ship constructed on or after 1 January 1990 but prior to 1 January 2000 shall comply with the emission limits set forth in subparagraph (d) of this paragraph, subject to the criteria in subparagraph (e) of this paragraph if an emission upgrade kit for that engine has been certified and the vessel is required to use that kit pursuant to a notification deposited with the Organization by an Administration.

b) Subparagraph (a) shall apply no later than the first intermediate or renewal survey that occurs 12 months or more after deposit of the notification in subparagraph (a).

c) The IAPP for a ship with an engine for which an emission kit has been certified will be revised when such a kit is installed to indicate that the engine is subject to the requirements of this regulation.

d) Subject to regulation 3 of this Annex, the operation of an engine described in subparagraph (a) is prohibited, except when the emission of nitrogen oxides (calculated as the total weighted emission of NO_2) from the engine does not exceed the following limits, where n = rated engine speed (crankshaft revolutions per minute):

   i) 17.0 g/kWh when n is less than 130 rpm;

   ii) $45.0*n^{-(0.2)}$ g/kWh when n is 130 or more but less than 2000 rpm; or

   iii) 9.8 g/kWh when n is 2000 rpm or more.

e) Certification of emission upgrade kits shall be pursuant to criteria [to be developed by the Organization][as specified in … of this Annex].