INTERNATIONAL MARITIME ORGANIZATION

E

MARINE ENVIRONMENT PROTECTION COMMITTEE
61st session
Agenda item 4

MEPC 61/4/3
16 July 2010
Original: ENGLISH

PREVENTION OF AIR POLLUTION FROM SHIPS

Consideration of Exhaust Gas Cleaning Systems and their approval pursuant to regulations 4 and 14 of MARPOL Annex VI

Submitted by the United States

SUMMARY

Executive summary:	This document responds to several issues that have been raised with respect to approval of Exhaust Gas Cleaning Systems under MARPOL Annex VI as an alternative compliance strategy pursuant to regulation 4. These include: whether additional procedures are needed for approval of these systems as equivalent alternatives pursuant to regulation 4; whether these systems can be demonstrated as meeting the requirements of regulation 14; and whether there are adequate enforcement provisions to ensure the proper use of these systems.
Strategic direction:	7.3
High-level action:	7.3.1
Planned output:	7.3.1.1
Action to be taken:	Paragraph 21
Related documents:	Resolution MEPC.184(59), MEPC 59/4/19, MEPC 59/24 and MEPC 60/4/25

Background

1 MEPC 59 adopted the "2009 Guidelines for Exhaust Gas Cleaning Systems" by resolution MEPC.184(59). At that time it was agreed that the washwater criteria should be revised in the future as more data become available on the contents of discharge and its effects, taking into account advice provided by GESAMP in document MEPC 59/4/19 (paragraph 4.32.6 of MEPC 59/24).

2 In document MEPC 59/4/19, GESAMP provided a report titled, "Advice by GESAMP on the interim criteria for discharge of washwater from Exhaust Gas Cleaning Systems for removal of sulphur-oxides". This report contains recommendations on quality control and standards, a monitoring programme, crew intervention, as well as an assessment of risks.

3 In document MEPC 60/4/25, Norway raised three sets of concerns about Exhaust Gas Cleaning Systems (EGCS), with respect to the procedures by which EGCS would be approved under regulation 14:

.1 whether equivalence of these devices can be demonstrated;

.2 whether technical changes need to be made to the guidelines; and

.3 whether there are adequate provisions regarding approval, enforcement, and compliance to ensure that EGCS achieve the required environmental outcome.

4 The purpose of this document is to provide additional information and to expand the discussion of the issues raised by Norway, both with respect to the criteria EGCS must meet to show equivalence and with respect to the procedures for the approval of equivalent technologies under regulation 4. The United States believes that the concerns of Norway can be addressed while maintaining the spirit of regulation 4 and avoiding the creation of barriers to the development and refinement of new emission control technologies that may provide less costly compliance alternatives to the requirements of regulation 14.

Concerns regarding demonstration of equivalence

5 Regulation 4 specifies that an Administration may allow an equivalent alternative if such an equivalent is "at least as effective in terms of emissions reductions as that required by the Annex". The EGCS Guidelines rely on a SO_2(ppm)/CO_2(% v/v) emission ratio calculation rather than a direct SO_x measurement calculated from the sulphur content of the fuel. Norway questions whether the measurement of SO_2 by itself adequately represents all SO_x compounds emitted and formed, and whether the CO_2 measurement location in the EGCS Guidelines is appropriate given reactions that can occur in a scrubber which may affect measured CO_2 emissions.

6 With regard to the use of SO_2 as a surrogate for SO_x, this issue was considered during the development of the EGCS Guidelines and the United States believes that further consideration of this issue is not warranted at this time. The SO_2 measurement was chosen for several reasons:

.1 SO_2 can easily be measured in the stack, whereas in-stack measurement of SO_3, H_2SO_3 and H_2SO_4 would be burdensome if not impossible;

.2 at least 95 per cent of fuel sulphur is emitted as SO_2;

.3 SO_3 and H_2SO_3 are very unstable in the exhaust and readily form H_2SO_4 (combined with water to make sulphates); and

.4 H_2SO_4 is removed from the exhaust by the device and enters the washwater.

7 With regard to whether the CO_2 measurement procedure in the EGCS guidelines is appropriate given reactions that can occur in a scrubber which may affect measured CO_2 emissions, the United States agrees that the device could affect measured CO_2 if it were measured downstream of the EGCS. However, the United States expects that the impact would likely be small in current EGCS designs. At the same time, at least one manufacturer claims to remove CO_2, in which case it would not be appropriate to measure CO_2 after the EGCS unit. The simple solution is to measure the CO_2 emissions upstream of the EGCS and the SO_2 emissions downstream of the EGCS. This can be corrected in practice and should be included in a future review of the guidelines.

Other technical questions raised by Norway

8 In document MEPC 60/4/25, Norway raised several technical questions. These are addressed below.

9 Possibility of formation of sulphuric acid

As exhaust gas cools after it exits the funnel, there is a potential for a decrease in the water content of the gas and the precipitation of entrained water. Norway notes that to avoid this it would be necessary to cool the exhaust gas to ambient temperature before it exits the funnel, and recommends that the EGCS Guidelines address this situation. However, this solution may not be appropriate. It would require a complex and expensive cooling system to bring exhaust temperatures down to ambient temperatures, especially during times when ambient air temperatures are cooler than ambient water temperatures. It is not clear why a specific solution should be included in the Guidelines. Device manufacturers have an incentive to design their systems to avoid this precipitation since owners will not invest in systems that will create a hazard to personnel or damage their ships.

10 Exceedence Events

GESAMP suggests that the Onboard Monitoring Manual (OMM) is silent with respect to the issue of intervention and corrective actions in the event of exceedances of the allowed discharge water quality criteria, and is very operational/ship specific. The United States believes this issue is addressed in that the EGC Technical Manual (ETM) contains such technical details (section 4.2.2 and section 5.6 of the Guidelines). The EGCS Guidelines currently state that the ETM must contain this guidance.

11 Washwater Criteria

GESAMP recommends that washwater criteria test methods should include recognized standard methods. Concern has been expressed that the washwater data collection guidance in Appendix III of the EGCS Guidelines does not identify specific methods. The United States believes that this issue is addressed sufficiently in Appendix III, which states that "sampling guidance and analysis should be undertaken by laboratories using EPA or ISO test procedures". This Appendix was created on the basis that more data should be collected on washwater discharge from vessels equipped with scrubbers, and improvements can be made to the washwater criteria when additional data become available in the future, if appropriate. However, discussions on more precise identification of test methods that are not overly burdensome may be appropriate when more experience is gained in this arena.

12 Other Test Parameters

A number of additional test parameters are suggested for inclusion in the list contained in Appendix III of the EGCS Guidelines: polychlorinated biphenyl concentration (PCB), polychlorinated dibenzodioxines concentration (PCDD), dissolved oxygen (DO) and/or chemical oxygen demand (COD), sulphate concentration, and sulphite concentration. However, diesel engines are not considered to be a significant source of PCB or PCDD. Also, the inclusion of DO and COD was already considered in the development of the Guidelines. With respect to sulphate and sulphite concentrations, the EGC states that exhaust gas composition in terms of SO_2 should be measured after the EGC unit to determine the sulphur reductions. It is unclear at this time how measuring sulphate or sulphite would provide additional information on sulphur reduction. Therefore, the United States does not agree that these additional pollutants should be added to the Guidelines.

Concerns regarding approval, enforcement, and compliance

13 The final two issues raised with respect to the EGCS Guidelines concern the approval of EGCS and provisions for enforcement and compliance.

Approval

14 With regard to the approval of EGCS, the concern is that the approval process does not take into account the interests of the countries in which ships equipped with these devices will operate. Norway notes that because washwater from these devices will affect areas under the control of other Administrations, the Guidelines should contain procedures for consulting with other states before any Administration approves an EGCS as an equivalent under regulation 4.

15 As a practical matter, it should be noted that such a consultative process could become unduly complicated as an EGCS can be installed on any ship that operates anywhere on the globe. Also, it should be noted that EGCS are not that different, in concept, from any pollution control equipment (e.g., engines or incinerators), yet the MARPOL Annex VI regimes do not require consultation on certification of this other equipment. For example, incinerators affect the ambient air where they are operated and create requirements for waste disposal. This is also the case for engines with respect to NO_x as well as pollutants that are not explicitly controlled through Annex VI (e.g., HC, CO, PM). The certification of these devices does not require consultation with other Administrations. Instead, a certificate issued by an Administration is deemed to be adequate evidence that an engine or an incinerator meets the requirements of Annex VI and relevant codes and Guidelines. In addition, such a procedure is not necessary because regulation 4.2 provides that the Administration that approves an equivalent such as an EGCS shall "communicate to the Organization for circulation to the parties particulars thereof, for their information and appropriate action, if any." Such appropriate action presumably includes submitting a notice of disagreement with the approval of an equivalent as well as engaging with other Administrations with regard to the approval. Finally, it should be remembered that the washwater criteria are still under development and those discussions will be forums to resolve concerns about the potential environmental impacts of these discharges.

Enforcement and Compliance

16 With regard to compliance and enforcement, the concern is how a surveyor will be able to determine whether a ship equipped with an equivalent device is operating the device correctly and therefore meeting the requirements of regulation 14. Ships that comply with regulation 14 by using compliant fuel will demonstrate compliance through bunker delivery notes as specified in regulation 18. However, there is a concern that there is no equivalent method to demonstrate compliance for ships equipped with EGCS.

17 It is important to note that a ship equipped with an EGCS is still subject to the survey and certification provisions in regulations 5 and 6 of Annex VI. Therefore, the shipowner remains responsible for demonstrating that the ship complies with regulation 14 and that an EGCS is being operated and maintained, even in the absence of Guidelines for how this demonstration is to be made. If the ship owner cannot adequately demonstrate compliance, a port State authority may take enforcement action. To avoid such action, it is expected that ship owners will work with EGCS manufacturers to ensure there is a transparent method to demonstrate continued compliance through logs, record books, and/or any other actions or measures that are relevant. It is reasonable for the Guidelines to call for manufacturers to provide such a verification procedure to verify compliance with regulation 14, similar to the verification procedure requirements contained in an engine's Technical File (section 2.4.1.4

of the NO_x Technical Code). However, not enough is known about all possible EGCS to create a specific set of recordkeeping and enforcement records for all devices, and it is important for the EGCS guidelines to remain flexible so as to not preclude the development of these devices. As data from operational scrubbers is collected in the future, it may be appropriate to develop and provide guidance in the EGCS.

Recommendation

18 Exhaust Gas Cleaning Systems are an emerging technology that has the potential to provide significant emission reductions at a low cost. Care should be taken to avoid revising the EGCS Guidelines in ways that would prevent the development of these systems. Any revisions to the Guidelines that address the concerns raised above should continue to allow a flexible approach toward demonstrating equivalent emission reductions and provide the opportunity for emerging technology to be developed and tested. Over time additional data will be obtained which will allow further refinement of the Guidelines.

19 To prevent multiple revisions of the EGCS Guidelines, the United States believes it is appropriate to postpone a review of the EGCS Guidelines until more data is collected on washwater discharge as per Appendix III of the guidelines.

20 This future review should take into account the above comments with respect to the location of CO_2 measurement, test procedures regarding washwater, and verification procedures for compliance surveys.

Action requested of the Committee

21 The Committee is invited to consider the points of view expressed in this document and take action as appropriate.