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PREVENTION OF AIR POLLUTION FROM SHIPS

Urgent matters emanating from BLG 12 – Review of MARPOL Annex VI and the NOx Technical Code

Note by the Secretariat

SUMMARY

Executive summary:	This document reports on urgent matters emanating from BLG 12, in particular on the review of MARPOL Annex VI and the NOx Technical Code, as well as the finalization of washwater discharge criteria for exhaust gas cleaning systems
Strategic direction:	7.3
High-level action:	7.3.1
Planned output:	7.3.1.1
Action to be taken:	Paragraph 52
Related documents:	MEPC 56/23, BLG 12/6 and BLG 12/17

Introduction

1 In accordance with the decision of MEPC 56 (MEPC 56/23, paragraph 4.18) the outcome of BLG 12 on the review of MARPOL Annex VI and the NOx Technical Code is reported, in summary form, as follows. The full report of BLG 12 is contained in document BLG 12/17.

Debate in plenary and establishment of the working group

2 BLG 12, recognizing there were 41 documents submitted, considered the matter in the following order:

.1 outcome of the second Intersessional Meeting of the Working Group on Air Pollution (BLG-WGAP 2);

.2 structure of the amended Annex VI;

.3 outcome of the Informal Cross Government/Industry Scientific Group of Experts;

.4 revision of MARPOL Annex VI – general issues;

.5 reduction of Sulphur and particulate matter (PM);

.6 NOx regulations for new engines;

.7 NOx regulations for existing engines;

.8 fuel oil quality; and

.9 re-establishing the Working Group on Air Pollution.

Structure of the amended Annex VI

3 BLG 12 considered, with a view to finalization, the proposed draft amendments to MARPOL Annex VI and noted the working group's considerations at the intersessional meeting related to the review of Annex VI in general, including the structure of the draft text. BLG 12 agreed that it would be desirable to keep the current structure of MARPOL Annex VI.

4 BLG 12 noted the draft guidelines for the development of a VOC management plan and agreed to forward them to MEPC 57 with a view to adoption.

Reduction of PM emissions

5 BLG 12 considered whether it would be appropriate to adopt explicit PM emission limits in the amended Annex VI or whether it should only recognize that PM emissions would be reduced as a function of reducing sulphur emissions.

6 An overwhelming majority of those delegations that spoke supported the view that no explicit PM limits should be introduced in the amended MARPOL Annex VI, but that PM emissions would be reduced as a function of reducing sulphur emissions.

Fuel oil specification in MARPOL Annex VI

7 BLG 12 considered the need for a detailed fuel oil specification in the amended MARPOL Annex VI. Having noted the working group's considerations at the intersessional meeting related to inclusion of fuel oil specifications in the amended Annex VI, BLG 12 considered whether it would be appropriate to develop fuel quality criteria (other than sulphur content) in the amended Annex VI, and if so, what fuel quality parameters had sufficient relevance to air quality and ship and crew safety to warrant inclusion in the amended Annex VI.

8 A significant majority of the delegations that spoke supported that BLG 12 should recommend to MEPC 57 to approach ISO inviting them to develop a draft fuel specification where also parameters related to air quality and ship safety is included for consideration by the appropriate IMO body.

Establishment of the working group

9 BLG 12, having debated the substantial issues in plenary, re-established the Working Group on Air Pollution under the chairmanship of Mr. Bryan Wood-Thomas (United States) with the following terms of reference:

"Taking into consideration submissions by Members and comments made in Plenary, the Working Group on Air Pollution was instructed to follow the terms of reference on the revision of MARPOL Annex VI and the NO_x Technical Code as agreed by MEPC 53 and to finalize all technical aspects of the revision and, in particular to:

.1 finalize the draft text of MARPOL Annex VI, including finalization of draft text for "Tier II" and "Tier III" NOx regulations for new engines, and text for possible NOx regulations for existing (pre-2000) engines;

.2 further develop the principal options for future sulphur and PM regulations as identified in BLG 12/6/1 annex 4 and in submissions to this session, and as possible, reduce the number of options to those that best represent the principal conceptual approaches to be presented to MEPC 57;

.3 finalize the revised text of the NOx Technical Code including developing a draft simplified certification scheme for existing (pre-2000) engines as a possible new chapter to the NOx Technical Code as well as inclusion of a new chapter on the direct measurement method;

.4 consider fuel oil quality issues related to the uncertainty about compliance with sulphur limits and how the issue should be solved to avoid continued ambiguity;

.5 identify guidelines or circulars related to MARPOL Annex VI or the NOx Technical Code that need to be developed or revised;

.6 review the proposed amendments to the Guidelines for Exhaust Gas Cleaning Systems (resolution MEPC.130(53)) and finalize the draft amended Guidelines;

.7 review and finalize the draft washwater criteria for Exhaust Gas Cleaning Systems for inclusion in the draft amended Guidelines;

.8 consider the introduction of market-based instruments to reduce emissions from international shipping and advise the Sub-Committee on an appropriate course of action;

.9 consider requirements regarding recording of residues from Exhaust Gas Cleaning Systems and under which Annex to MARPOL it should be regulated; and

.10 report the outcome of the work to Plenary in a written report by Thursday, 7 February."

Report of the working group

10 The working group met from 5 to 7 February 2008 with more than 150 participants from 29 Member States, an Associate Member, a State not Member of IMO, by observers from an intergovernmental organization and from 14 non-governmental organizations in consultative status.

11 The Chairman of the Air Pollution Working Group, Mr. Bryan Wood-Thomas (United States) introduced the report (BLG 12/WP.6) and informed the Sub-Committee that the working group had covered a tremendous number of issues in the time available. Notwithstanding that many of the issues were characterized by a wide diversity of opinions, the working group was able to reach agreement on a number of significant issues that would enable the Sub-Committee to go forward with a much smaller set of issues. The working group chairman summarized the work as follows:

.1 First, and most significantly, the working group was able to reach agreement on the respective Tier II and Tier III NOx standards to be applied to new builds. The group agreed to a package between the Tier II and III standards since many delegations were clear that agreement on the Tier II level was also connected to the level and approach adopted under Tier III. The group agreed to these standards and the relevant text was free of any square brackets. The group also agreed to include a technical review provision to provide for a review of the relevant technologies four years prior to implementation of the Tier III standard.

.2 With respect to the NOx Technical Code, the group resolved earlier debates concerning the certification of serially produced engines, direct measurement and monitoring methods, a draft certification procedure for existing engines, and test cycles to be applied to Tier II and Tier III engines.

.3 With respect to existing engines, the group made further progress, but there still remained a fundamental difference of opinion on whether a standard addressing existing engines should be adopted and if adopted, what implementation approach would be most appropriate. The group did agree that any standard should be restricted to engines between 1990 and 1999, but differences remain on whether the respective engines should be defined by cylinder displacement or engine power. Many delegations have noted that inadequate information has been presented to date that would allow the group to make a decision on this matter. The European Commission has also noted that it will complete a study on the matter in the next 10 days and will share this information for consideration by the Organization.

.4 The working group also tackled the debate concerning the variance in fuel quality testing procedures and related enforcement issues with the sulphur limits specified in the Annex. The solution specifies a protocol for determining compliance with the respective limits while defining the protocol to be employed when an individual test result exceeds the limit specified in the Annex.

.5 The group considered the introduction of market-based instruments and trials under the Annex, but fundamental questions remained. Recognizing the number of questions surrounding the proposal, the working group concluded that it could not recommend to the Sub-Committee that a market-based instrument or trials for such instruments be included in the amendments to MARPOL Annex VI.

.6 The working group considered the six options tabled to date for controlling SOx and PM. The group reviewed the history of discussion on the various options under consideration and while recognizing that it would be difficult to reduce the options under consideration, the group agreed that it would be useful to reduce the six options to two2 or three to better facilitate discussion and debate in the Sub-Committee and the Committee. The group agreed on three options that should offer a reasonable basis for framing future discussion of this important issue.

.7 The three options are not intended to be definitive choices that restrain the development or construction of alternatives. Rather the three options are put forward since they capture the principal concepts outlined in the discussion to date. The SOx issue and the decisions that would ultimately be made by the Organization on this matter have tremendous implications for the marine sector, public health, the environment, and the refinery industry. Recognizing that the working group repeatedly emphasized that our intent was to "set the table" for further discussion by the Sub-Committee and Committee.

.8 The working group Chairman stressed that the respective implementation dates, control levels, and concepts outlined in the three options were all subject to future debate and modification and that nothing precludes the development of a hybrid proposal or proposals should it offer a way forward to agreement. This was especially true given the significant implications associated with the final decisions by the Organization on this matter and the need to carefully consider the information contained in the recently completed report of the Scientific Group of Experts established by the Secretary-General.

.9 The group also addressed a number of other matters including finalization of the draft exhaust gas cleaning guidelines and washwater discharge criteria as called for in the terms of reference.

.10 Before concluding, the working group Chairman extended his appreciation to all working group members who had exhibited great patience and creativity in working through a number of issues that required considerable effort to find solutions that were acceptable to the many parties concerned. He also thanked the IMO staff who, as always, had worked late in the morning each of the last three nights to enable the working group to reach its conclusions and deliver its report.

Relaxed deadline to MEPC 57 for comments on the outcome of BLG 12

12 BLG 12 recalled that MEPC 56 included the outcome of BLG 12 on the review of MARPOL Annex VI and the NOx Technical Code as an urgent matter to be reported to MEPC 57.

13 To provide members with the possibility to comment on the outcome of BLG 12 on the review of MARPOL Annex VI and the NOx Technical Code, the Secretariat had, in accordance with paragraph 4.12 of the Guidelines, consulted the Chairman of the Committee and obtained his authorization for a relaxed deadline by two weeks for documents to MEPC 57 commenting on the report from BLG 12 on this issue. The deadline for comments would be Friday, 22 February 2008. BLG 12 noted that these documents would be considered by the Committee only if it decides to do so at the opening of its session.

Action taken by the Sub-Committee on the report of the Working Group

14 Having considered the report of the working group (BLG 12/WP.6), BLG 12 approved it in general.

Draft text for the amended MARPOL Annex VI

15 BLG 12 noted that the working group had completed the tasks assigned to the group in the terms of reference and finalized draft text for the amended MARPOL Annex VI. BLG 12 agreed to forward the draft to the Committee for consideration with a view to adoption at MEPC 58 (annex 1).

NOx regulations new engines – Tier II and Tier III Standards

16 BLG 12 noted that the working group had agreed on future Tier II and Tier III NOx standards for new engines installed on ships constructed on or after 1 January 2011 and 1 January 2016, respectively. The Sub-Committee agreed that the NOx limits in Tier II and Tier III could not be considered in isolation, but should be considered as a package. If only modest reductions were established in Tier III, significantly more stringent limits had to be introduced for Tier II. However, if significant reduction would be achieved as a result of the agreed Tier II standard, more modest reduction targets could be introduced in Tier III.

17 BLG 12 also noted that a number of delegations had expressed the view that a geographically based approach that requires significant reductions in Emission Control Areas (ECAs), should be introduced as this approach provided a global framework for reducing NOx emissions in coastal areas with the most severe problems while allowing operation at the Tier II level outside Emission Control Areas. It was also noted that this approach would offer significant protection of the environment and human health while avoiding increased fuel consumption that is associated with less advanced NOx reduction technologies.

18 Some delegations noted that while they had supported the 40-50% global reduction option in previous discussions, recognizing the need of some regions to achieve more stringent reductions has led them to support an 80% reduction in Emission Control Areas. The United States also noted that while they had proposed a reduction of 83-87% from Tier I levels, they could support an 80% reduction as discussed by the working group.

19 BLG 12 noted that the working group unanimously agreed to support a Tier II reduction as proposed by China (outlined in paragraph 4.4 of BLG 12/WP.1) and a Tier III reduction of 80% from Tier I applicable to new builds beginning on 1 January 2016 in specific emission control areas designated through the Organization. As such, the Tier III limits would apply in designated areas but not in coastal areas defined by a fixed distance from the baseline around the globe.

20 BLG 12 agreed to include a provision in the amended Annex to provide for a technical review to ensure that systems capable of meeting the 80% Tier III standard will be available in 2016 text is set out in draft paragraph (10) of regulation 13 in the draft amended Annex VI set out in annex 1 to this report.

21 BLG 12 noted that the working group had agreed to text under Appendix 3 of the amended Annex VI that stipulates specific criteria relevant to controlling NOx in an Emission Control Area. As structured in the revised regulations 13 and 14 as well as Appendix 3, a State or Group of States may propose an Emission Control Area where 1) NOx alone is controlled for Tier III new builds, 2) SOx and PM alone are reduced through the agreed IMO sulphur limit, or 3) NOx, SOx, and PM are controlled through application of the agreed sulphur limit and application of the Tier III NOx standard.

22 BLG 12 noted the working group's considerations on how engines undergoing a major conversion will be treated in different circumstances as we progress from Tier I to Tier II and from Tier II to Tier III. BLG 12 further noted that the working group had produced a table outlining a scheme identifying what engines would be subject to what standards as a given modification or replacement was made in a given year (e.g., post 2011 and post 2016). The table is set out below. More specific drafting of the provisions is set out in paragraph (2)(b) of regulation 13 of Annex 1 of this document. The table set forth below illustrates the requirements set forth in Annex 1, paragraphs (b) and (c) of regulation 13(2). It addresses the issues raised in paragraphs (i) and (ii) of regulation 13(2)(a).

Major Conversions (MC) within a multi-tiered NO_x control

Replacement or additional engines

Ship construction date	**Engine certification requirement**
Pre-2000	Identical Replacement – no NO_x cert requirement
Pre-2000	To be certified to the Tier appropriate to the date of installation (Tier 1 2000 – 2010, Tier II 2011 – 2015) except in the case of Replacement engine post 2016 – if possible (GTBD*), – if not Tier II
2000 – 2010 & 2011 – 2015	Tier appropriate to the installation date except in the case of [Replacement engine] post 2016 – if possible (GTBD*), – if not Tier II
2016 +	Tier III

* Guidelines to be developed.

MCR 10% increase or substantial modification (as defined in the NOx Technical Code)

Ship construction date	**Engine certification requirement**
Pre-2000	Tier I irrespective of date of MC
2000 – 2010	Tier I irrespective of date of MC
2011 – 2015	Tier II irrespective of date of MC
2016 +	Tier III

Note: NO_x Technical Code substantial modification clauses to be reviewed and amended as necessary.

23 FOEI strongly objected to the treatment of major conversion engines reflected in the above table since a substantial modification or MCR increase of more than 10% to a post-2000 engine would not be subject to a requirement to upgrade the engine to the current emission standard.

24 CESA expressed concern that the proposal may create an artificial incentive to extend the operating life of ships and engines by extensive modification and rebuilding beyond normal commercial practice, to avoid building new ships.

NOx Standards for Existing Engines

25 BLG 12 noted the working group considerations related to possible introduction of NOx standards for existing (pre-2000) engine and the two different draft options developed by the working group, although it was recognized that there also was an option not to include NOx standards for existing engines in the amended MARPOL Annex VI.

26 BLG 12 noted that the working group reviewed whether it was appropriate and feasible to establish a standard applicable to some set of pre-2000 marine diesel engines and noted that three critical elements needed to be addressed to facilitate a decision on this by the Committee. The first element concerns the specific years to be included in such a standard (i.e., how far back to go …1990, 1985, etc.). The second variable concerns how to define the engines covered (e.g., cylinder size, power, or an alternative mechanism). The third element is how such a system would be implemented.

27 With respect to the first element, the working group had agreed that the appropriate set of years to be considered was 1990 to 1999 since older ships would be too close to the end of their expected lifespan to warrant inclusion.

28 With respect to the specific engines to be covered, there was a wide range of opinions on how to define the engines to be covered with some favouring definition by minimum cylinder volume (e.g., 90 litres) and others favouring the minimum power rating of the engine (e.g., 5000 kW).

29 Concerning implementation, two principal approaches were considered. The first would apply the standard to all engines regardless of availability and would subject ships who could not upgrade to some form of punitive or alternative treatment (e.g., denial of port entry, a requirement to use distillate fuel, or some alternative measure such as de-rating the ship). The second approach would employ a market-based "kit-approach" where the standard would apply to only those engines where an upgrade kit was commercially available.

30 FOEI expressed serious concern that none of the proposals to date to reduce NOx from existing ships are adequate to protect human health and the environment.

31 BLG 12 noted that the working group was unable to agree on whether it was appropriate to adopt a standard for existing engines since many delegations felt inadequate information and studies had been submitted that would inform such a decision. In addition, the working group was unable to agree on what approach would be most effective should a decision be made to include such a standard. Some delegations favour a kit-based approach, while others favour an approach that would apply to all engines of a given type (e.g., only two-stroke, all engines above 90 litres or 5000 kW) and time period (e.g., 1990-1999).

Options for Addressing SOx and PM Emissions from Ships

32 BLG 12 noted the three different options for reduction of SOx and PM emissions that the working group had agreed represented an equitable and fair compression of the different concepts and proposal under consideration by the Organization.

33 BLG 12 agreed, given the tremendous importance of this issue and the significant environmental, human health, and economic consequences of a decision on this matter, that it was appropriate that policy decisions should be taken by the Committee and that the principal task of the Sub-Committee group was to "set the table" for discussion of this critical issue.

34 BLG 12 agreed that the three options identified below represented an equitable and fair condensation of the concepts and proposals under consideration by the Organization. The three options would constitute an appropriate resolution for framing future discussion of this important issue. BLG 12 agreed to go forward with three options as described below:

Option 1 Global

1.00% (10,000 ppm)* fuel standard applied globally in [2012]
0.50% (5,000 ppm)* fuel standard applied globally in [2015]

Option 2 Global/Regional

Global cap remains unchanged at 4.50% (45,000 ppm)*
Emission Control Areas require 0.10% (1,000 ppm)* standard in [2012]

Option 3 Global/Regional with Micro-Areas

Global cap is lowered to 3.00% (30,000 ppm)* in [2012]
Emission Control Area standard lowered to 1.00% (10,000 ppm)* in [2010]
Emission Control Area standard lowered to 0.50% (5,000 ppm)* in [2015]
Micro-Emission Control Areas may be established at a distance of no more than 24 nautical miles from the baseline with a 0.10% (1,000 ppm) standard. A proposal for such Micro-Emission Control Areas must be submitted to the IMO for review, but are to be subject to a relaxed set of criteria.

* *The respective parts per million (ppm) and corresponding percentages all refer to maximum sulphur content limits by mass.*

35 It was agreed that the respective implementation dates, sulphur levels, and concepts outlined in the above options would all be subject to debate and modification and that nothing precluded the development of a hybrid proposal.

36 IPIECA expressed significant concern that sufficient quantities of compliant fuel would be available to enable the options as presented with respect to sulphur levels and implementation dates. IPIECA urged IMO to adequately consider the practicalities of the fuel supply chain (refining and distribution capabilities) to respond to the resultant changes in the demand pattern. As initially presented, all options would require significant changes in product output from many refineries around the world with some options representing an unprecedented single step regulatory change compared to the changes that have driven global fuel markets in the past decade. Particular attention was drawn to the need to:

.1 maintain the production link between marine fuel and land-based fuel with respect to specifications around the world; and

.2 adopt a phased approach such that refinery and supply configurations can be adapted in response to the market signals to ensure continued availability and supply without major disruptions.

37 Spain stressed the need to establish feasible and workable measures to be implemented by 2010 and reasoned that the amended Annex VI needed to be responsible in its call for reduction of air pollution from ships in the near future.

38 FOEI informed the Sub-Committee that it had submitted to MEPC 57 document MEPC 57/4/15 containing information on a new study estimating premature mortality from shipping emissions, building on the scientific study introduced in BLG 12/6/9. The new study examined two emission control scenarios: one with a 0.1% fuel sulphur limit for ships in coastal areas within 200 nm off all the world's coasts; and a second with 0.5% fuel sulphur limit globally. The study results showed a 50 to 60% reduction by 2012 in premature deaths caused by SOx and PM emissions from ships. The report of the Informal Cross Government/Industry Scientific Group of Experts estimated costs of both a global 0.5% sulphur option and a 0.1% sulphur regional option. In both cases, costs of emission control were far below the social benefits estimated from reductions of premature mortality. These benefits were estimated at USD$225-275 billion each year. A close review of the Scientific Group of Experts' report showed no CO_2 penalty for either the global 0.5% sulphur option or the 0.1% sulphur regional option.

39 BLG 12 noted that in the event a decision was made to incorporate Micro-Emission Control Areas into the amended Annex, it would be necessary to examine how the criteria in Appendix 3 of the Annex would be amended to address such areas. The group did not have time to discuss and review possible changes to the criteria and some delegations were of the view that such consideration should be held in abeyance until a decision was taken in the Committee as to whether such areas would be part of the final solution. Others noted that any delegation would, of course, be free to propose how the Appendix 3 criteria may be amended should Micro-Emission Control Areas be part of the amended regulation 13. It was also noted that IMO might consider alternative terminology such as "Limited Emission Control Areas" or "Local Emission Control Areas".

40 It was generally understood that Option 1 was the former Option C. Often referred to as the INTERTANKO proposal or option C in annex 4 to BLG 12/6/1 (and MEPC 57/4). The proposal combines a distillate requirement with a corresponding fuel oil specification that can be attached to the amended MARPOL Annex VI.

41 BLG 12 considered that it may be appropriate to add a review clause to the amended regulation 14, but recognized that the decision depended upon the final decision concerning what sulphur limits would be finally adopted by the Committee under the amended Annex VI.

The NOx Technical Code

42 BLG 12 noted that the working group had finalized text to amend the NOx Technical Code and instructed the Secretariat to compile the agreed amendments and present a clean draft of the agreed proposed amendments to MEPC 57 for consideration with a view to adoption at MEPC 58 (annex 2).

43 BLG 12 noted in particular that the working group had considered four specific issues that had been outstanding with respect to the NOx Technical Code. The four issues were: 1) certification of serially produced engines, 2) a draft certification procedure for existing engines, 3) chapter 6.4 of the Code regarding direct measurement and monitoring, and 4) test cycles for Tier II and Tier III NOx standards.

Exhaust Gas Cleaning Guidelines including Washwater Discharge Criteria

44 BLG 12 noted that the working group had finalized the revised guidelines for exhaust gas cleaning systems and washwater criteria for such systems and agreed to forward the proposed amendments to the guidelines to MEPC 57 for consideration with a view to adoption (annex 3).

45 In the course of reviewing the draft amendments a number of delegations questioned whether it was appropriate to adopt such guidelines in light of the limited commercial experience with marine applications to date and the lack of studies concerning the environmental effects of such discharges into the aquatic environment. Nonetheless, BLG 12 agreed to recommend that the draft revised guidelines and the washwater discharge criteria contained therein be forwarded for discussion and possible adoption by the Committee.

46 In reviewing the draft guidelines, Germany, Greece, Ireland, the Marshall Islands, Panama, the European Commission, and INTERTANKO all stressed the need that specific information on the characteristics of the residues produced by exhaust gas cleaning systems is critical since the characteristics of the waste stream are essential to anticipate what type of reception facility and waste disposal protocol would be appropriate for such residues. A number of delegations expressed concern that regulation 17(2) in the draft amended Annex VI allows ports and terminals to exempt themselves from the provision of appropriate reception facilities. It was also stressed that it is of critical importance that waste reception facilities be provided for such residues. In this regard, the Marshall Islands and Vanuatu noted that they would reserve their positions on the adoption of that specific provision.

47 The European Commission expressed concern that the proposed guidelines do not regulate emissions outside ports and estuaries. While it is likely scrubbers will be used in Emission Control Areas in practice, no operational or discharge criteria will apply to a large part of the scrubber's operation.

Market-based Instruments

48 BLG 12 noted that the working group concluded that given the number and the complexity of the legal questions that had to be solved, the working group could not recommend introducing a provision for market-based instruments, or trials for such instruments, in the amended MARPOL Annex VI.

Non-mandatory instruments to be developed by the Organization

49 BLG 12 noted that the working group had identified the non-mandatory instruments such as guidelines and circulars that needed to be developed or updated as a consequence of the amendments to MARPOL Annex VI and the NOx Technical Code.

Non-mandatory instruments related to MARPOL Annex VI:

.1 The identified non-mandatory instruments are listed in prioritized order:

.1 Regulation 14(4)(c): Any other technological method that is verifiable and enforceable to limit SOx and PM emissions to a level equivalent to that described in subparagraphs (a) or (b);

.2 Regulation 13(8)(2): Equivalent methods of reducing NOx limits on-board to the specified limits;

.3 Regulation 13(2)(a): When it is not possible to install replacement engines to meet the Tier 3 limits; and

.4 Regulation 15(6): VOC Management plan (drafted but not adopted, attached as an appendix to annex 1).

Non-mandatory instruments related to the NOx Technical Code:

.2 The identified non-mandatory instruments are listed in prioritized order;

.1 type Approval of NOx reduction systems for Tier III (specifically SCR systems);

.2 approval procedures for the "approved method" with regard to existing engines, including identifying the content of the simplified technical file; and

.3 certification of engines to Tier III and procedures for on-board verification of performance.

Verification of sulphur content in fuel oil

50 BLG 12 noted that the working group had developed a draft fuel verification procedure to address concerns about sulphur testing repeatability as well as reproducibility. The draft procedure was supported by all members of the working group as an equitable and practical mechanism for handling variance in test results. The draft procedure is set out as regulation 18(6)(b) in the draft amended Annex VI and draft Appendix VI (to Annex VI) in annex 1 to this report.

51 BLG 12 agreed on the draft verification procedure developed by the working group on verification of sulphur content in fuel oil and agreed that this procedure could also be used as guidance in the interim period before the amendments to MARPOL Annex VI entered into force.

Action requested of the Committee

52 The Committee is invited to consider the outcome of BLG 12 on the review of MARPOL Annex VI and the NOx Technical Code and, in particular, to:

.1 note that BLG 12 has completed the technical aspects of the review of MARPOL Annex VI and the NOx Technical Code and has finalized the draft text for the two instruments and agreed to forward the drafts to the Committee for consideration with a view to adoption at MEPC 58 (paragraph 15, and annex 1);

.2 note that BLG 12 agreed that the current structure of MARPOL Annex VI should be maintained (paragraph 3);

.3 note that BLG 12 agreed on future Tier II and Tier III NOx standards for new engines installed on ships constructed on or after 1 January 2011 and 1 January 2016, respectively (paragraphs 16 to 24, and regulations 13(4) and 13(5) of annex 1);

.4 note the BLG 12's considerations related to possible introduction of NOx standards for existing (pre-2000) engines and the two different draft options for possible approaches, although it was recognized by the Sub-Committee that there also was an option not to include NOx standards for existing engines in the amended MARPOL Annex VI (paragraphs 25 to 31, and regulation 13(7) of annex 1);

.5 note that BLG 12 agreed that no explicit PM limits should be introduced in the amended MARPOL Annex VI, but that PM emissions would be reduced as a function of reducing sulphur emissions (paragraphs 5 and 6);

.6 note that BLG 12 agreed that the three different options identified for reduction of SOx and PM emissions represented an equitable and fair compression of the different concepts and proposals under consideration by the Organization (paragraphs 32 to 41 and regulation 14 of annex 1);

.7 approach ISO inviting them to develop a draft fuel oil specification where also parameters related to air quality and ship safety is included (paragraphs 7 and 8);

.8 note that BLG 12 finalized the draft text to amend the NOx Technical Code and that the Secretariat was instructed to compile the agreed amendments and present a clean draft of the agreed proposed amendments to the Committee for consideration with a view to adoption at MEPC 58 (paragraphs 42 and 43 and annex 2);

.9 note that BLG 12 finalized proposed draft amendments to the revised guidelines for exhaust gas cleaning systems as well as washwater criteria for such systems and agreed to forward the proposed draft amendments to the Committee for consideration with a view to adoption at a subsequent session (paragraphs 44 to 47 and annex 3);

.10 note that BLG 12 could not recommend introducing market-based instrument in the revised MARPOL Annex VI (paragraph 48);

.11 note that BLG 12 identified the non-mandatory instruments, such as guidelines and circulars, that needed to be developed or updated as a consequence of the amendments to MARPOL Annex VI and the NOx Technical Code (paragraph 49);

.12 note that BLG 12 agreed on a draft procedure to verify sulphur content in fuel and that this procedure could also be used as guidance in the interim period before the amendments enter into force (paragraphs 50 and 51, regulation 18(6)(b) of annex 1 and Appendix VI to annex 1); and

.13 consider with a view to adoption the draft guidelines for the development of a VOC management plan (paragraph 4, regulations 15(6) and 15(7) in annex 1 and annex 4).

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ANNEX 1

DRAFT AMENDED MARPOL ANNEX VI

Regulations for the Prevention of Air Pollution from Ships

CHAPTER I – GENERAL

Regulation 1
Application

The provisions of this Annex shall apply to all ships, except where expressly provided otherwise in regulations 3, 5, 6, 13, 15, and 18 of this Annex.

Regulation 2
Definitions

For the purpose of this Annex:

(1) "A similar stage of construction" means the stage at which:

(a) construction identifiable with a specific ship begins; and

(b) assembly of that ship has commenced comprising at least 50 tonnes or one per cent of the estimated mass of all structural material, whichever is less.

(2) "Auxiliary control device" means a system, function, or control strategy installed on an engine that is used to protect the engine and/or its ancillary equipment against operating conditions that could result in damage or failure, or that is used to facilitate the starting of the engine. An auxiliary control device may also be a strategy or measure that has been satisfactorily demonstrated not to be a defeat device.

(3) "Continuous feeding" is defined as the process whereby waste is fed into a combustion chamber without human assistance while the incinerator is in normal operating conditions with the combustion chamber operative temperature between 850°C and 1200°C.

(4) "Defeat device" means a device which measures, senses, or responds to operating variables (e.g., engine speed, temperature, intake pressure or any other parameter) for the purpose of activating, modulating, delaying or deactivating the operation of any component or the function of the emission control system such that the effectiveness of the emission control system is reduced under conditions encountered during normal operation, unless the use of such a device is substantially included in the applied emission certification test procedures.

(5) "Diesel engine" means any reciprocating internal-combustion engine operating on liquid or dual fuel, to which regulation 13 of Annex VI, as amended, applies, including booster/compound systems if applicable.

(6) "Emission" means any release of substances, subject to control by this Annex, from ships into the atmosphere or sea.

(7) "Emission Control Area" means an area where the adoption of special mandatory measures for emissions from ships is required to prevent, reduce and control air pollution from SOx, NOx, and particulate matter and its attendant adverse impacts on human health and the environment. Emission Control Areas shall include those listed in, or designated under, regulations 13 and 14 of this Annex.

(8) "*Fuel oil*" means any fuel delivered to and intended for combustion purposes for propulsion or operation on board a ship, including distillate and residual fuels.

(9) "Gross tonnage" means the gross tonnage calculated in accordance with the tonnage measurement regulations contained in Annex I to the International Convention on Tonnage Measurements of Ships, 1969 or any successor Convention.

(10) "Installations", in relation to regulation 12 of this Annex, means the installation of systems, equipment, including portable fire extinguishing units, insulation, or other material on a ship, but excludes repair or recharge of previously installed systems, equipment, insulation, or other material, or recharge of portable fire extinguishing units.

(11) "Installed" means a marine engine that is or is intended to be installed on a ship, including a portable auxiliary marine engine, only if its fuelling, cooling, or exhaust system is an integral part of the ship. A fuelling system is considered integral to the ship only if it is permanently affixed to the ship.

(12) "Irrational emission control strategy" means any strategy or measure that, when the ship is operated under normal conditions of use, reduces the effectiveness of the emission control system to a level below that expected on the applicable emission test procedures.

(13) "NOx Technical Code" means the Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines, as amended.

(14) "Ozone depleting substances" means controlled substances defined in paragraph 4 of article 1 of the Montreal Protocol on Substances that Deplete the Ozone Layer, 1987, listed in Annexes A, B, C or E to the said Protocol in force at the time of application or interpretation of this Annex.

"Ozone depleting substances" that may be found on board ship include, but are not limited to:

Halon 1211 Bromochlorodifluoromethane.

Halon 1301 Bromotrifluoromethane

Halon 2402 1, 2-Dibromo -1, 1, 2, 2-tetraflouroethane (also known as Halon 114B2)

CFC-11 Trichlorofluoromethane

CFC-12 Dichlorodiflouromethane

CFC-113 1, 1, 2 – Trichloro – 1, 2, 2 – tetrafluoroethane

CFC-114 1, 2 – Dichloro –1, 1, 2, 2 – tetrafluoroethane

CFC-115 Chloropentafluoroethane

(15) "Sludge oil" means sludge from the fuel or lubricating oil separators, waste lubricating oil from main or auxiliary machinery, or waste oil from bilge water separators, oil filtering equipment or drip trays.

(16) "Shipboard incineration" means the incineration of wastes or other matter on board a ship, if such wastes or other matter were generated during the normal operation of that ship.

(17) "Shipboard incinerator" means a shipboard facility designed for the primary purpose of incineration.

(18) "Ships constructed" means ships the keels of which are laid or which are at a similar stage of construction.

(19) "Tanker" means an oil tanker as defined in regulation 1(5) of Annex I or a chemical tanker as defined in regulation 1(16.1) of Annex II of the present Convention.

(20) "Annex VI, as amended" means the 2008 amendments to the annex to the Protocol of 1997 to amend the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto.

Regulation 3
Exceptions and Exemptions

Regulations of this Annex shall not apply to:

General

(1) (a) any emission necessary for the purpose of securing the safety of a ship or saving life at sea; or

(b) any emission resulting from damage to a ship or its equipment:

(i) provided that all reasonable precautions have been taken after the occurrence of the damage or discovery of the emission for the purpose of preventing or minimizing the emission; and

(ii) except if the owner or the master acted either with intent to cause damage, or recklessly and with knowledge that damage would probably result.

Trials for Ship Emission Reduction and Control Technology Research

(2) An Administration may, in co-operation with other Administrations as appropriate, issue an exemption from specific provisions of this Annex for a ship to conduct trials for the development of ship emission reduction and control technologies. Such an exemption shall only be provided if the applications of specific provisions of the Annex or the NOx Technical Code may impede research into the development of such technologies. A permit for such an exemption shall:

(a) only be provided to the minimum number of ships necessary to effectively test ship emission reduction and control technologies; and

(b) not exceed [18 months][5 years] in duration, after which a permitting Administration or Administrations shall analyse whether the exemption for a ship should be renewed in order to achieve effective results from the trial of a ship emission reduction and control technology.

Emission from Petroleum Activity

(3) (a) Emissions directly arising from the exploration, exploitation and associated offshore processing of sub-sea-bed mineral resources are, consistent with article 2(3)(b)(ii) of the present Convention, exempt from the provisions of this Annex. Such emissions include the following:

(i) emissions resulting from the incineration of substances that are solely and directly the result of exploration, exploitation and associated offshore processing of sub-sea-bed mineral resources, including but not limited to the flaring of hydrocarbons and the burning of cuttings, muds, and/or stimulation fluids during well completion and testing operations, and flaring arising from upset conditions;

(ii) the release of gases and volatile compounds entrained in drilling fluids and cuttings;

(iii) emissions associated solely and directly with the treatment, handling, or storage of sub-sea-bed minerals; and

(iv) emissions from diesel engines that are solely dedicated to the exploration, exploitation and associated offshore processing of sub-sea-bed mineral resources.

(b) The requirements of regulation 18 of this Annex shall not apply to the use of hydrocarbons which are produced and subsequently used on site as fuel, when approved by the Administration.

Regulation 4
Equivalents

(1) The Administration may allow any fitting, material, appliance or apparatus to be fitted in a ship or other procedures or compliance methods used as an alternative to that required by this Annex if such fitting, material, appliance or apparatus or other procedures or compliance methods are at least as effective as that required by this Annex.

(2) The Administration which allows a fitting, material, appliance or apparatus or other procedures or compliance methods used as an alternative to that required by this Annex shall communicate to the Organization for circulation to the Parties particulars thereof, for their information and appropriate action, if any.

CHAPTER II
SURVEY, CERTIFICATION AND MEANS OF CONTROL

Regulation 5
Surveys

(1) Every ship of 400 gross tonnage and above and every fixed and floating drilling rig and other platforms shall be subject to the surveys specified below:

(a) An initial survey before the ship is put into service or before the certificate required under regulation 6 of this Annex is issued for the first time. This survey shall be such as to ensure that the equipment, systems, fittings, arrangements and material fully comply with the applicable requirements of this Annex;

(b) A renewal survey at intervals specified by the Administration, but not exceeding five years, except where regulation 9(2), 9(5), 9(6) or 9(7) of this Annex is applicable. The renewal survey shall be such as to ensure that the equipment, systems, fittings, arrangements and material fully comply with applicable requirements of this Annex;

(c) An intermediate survey within three months before or after the second anniversary date or within three months before or after the third anniversary date of the certificate which shall take the place of one of the annual surveys specified in paragraph (1)(d) of this regulation. The intermediate survey shall be such as to ensure that the equipment and arrangements fully comply with the applicable requirements of this Annex and are in good working order. Such intermediate surveys shall be endorsed on the certificate issued under regulations 6 or 7 of this Annex;

(d) An annual survey within three months before or after each anniversary date of the certificate, including a general inspection of the equipment, systems, fittings, arrangements and material referred to in paragraph (1)(a) of this regulation to ensure that they have been maintained in accordance with paragraph (4) of this regulation and that they remain satisfactory for the service for which the ship is intended. Such annual surveys shall be endorsed on the certificate issued under regulations 6 or 7 of this Annex; and

(e) An additional survey either general or partial, according to the circumstances, shall be made after a repair resulting from investigations prescribed in paragraph (4) of this regulation, or whenever any important repairs or renewals are made. The survey shall be such as to ensure that the necessary repairs or renewals have been effectively made, that the material and workmanship of such repairs or renewals are in all respects satisfactory and that the ship complies in all respects with the requirements of this Annex.

(2) In the case of ships of less than 400 gross tonnage, the Administration may establish appropriate measures in order to ensure that the applicable provisions of this Annex are complied with.

(3) (a) Surveys of ships as regards the enforcement of the provisions of this Annex shall be carried out by officers of the Administration. The Administration may, however, entrust the surveys either to surveyors nominated for the purpose or to organizations recognized by it. Such organizations shall comply with the guidelines adopted by the Organization;*

(b) The survey of engines and equipment for compliance with regulation 13 of this Annex shall be conducted in accordance with the NOx Technical Code;

(c) When a nominated surveyor or recognized organization determines that the condition of the equipment does not correspond substantially with the particulars of the certificate, they shall ensure that corrective action is taken and shall in due course notify the Administration. If such corrective action is not taken, the certificate should be withdrawn by the Administration. If the ship is in a port of another Party, the appropriate authorities of the port State shall also be notified immediately. When an officer of the Administration, a nominated surveyor or recognized organization has notified the appropriate authorities of the port State, the Government of the port State concerned shall give such officer, surveyor or organization any necessary assistance to carry out their obligations under this regulation; and

(d) In every case, the Administration concerned shall fully guarantee the completeness and efficiency of the survey and shall undertake to ensure the necessary arrangements to satisfy this obligation.

(4) (a) The equipment shall be maintained to conform with the provisions of this Annex and no changes shall be made in the equipment, systems, fittings, arrangements, or material covered by the survey, without the express approval of the Administration. The direct replacement of such equipment and fittings with equipment and fittings that conform with the provisions of this Annex is permitted; and

(b) Whenever an accident occurs to a ship or a defect is discovered, which substantially affects the efficiency or completeness of its equipment covered by this Annex, the master or owner of the ship shall report at the earliest opportunity to the Administration, a nominated surveyor, or recognized organization responsible for issuing the relevant certificate.

Regulation 6
Issue of endorsement of a Certificate

(1) An International Air Pollution Prevention Certificate shall be issued, after an initial or renewal survey in accordance with the provisions of regulation 5 of this Annex, to:

(a) any ship of 400 gross tonnage and above engaged in voyages to ports or offshore terminals under the jurisdiction of other Parties; and

* Refer to the Guidelines for the authorization of organizations acting on behalf of the Administration, adopted by the Organization by resolution A.739(18), and the Specifications on the survey and certification functions of recognized organizations acting on behalf of the Administration, adopted by the Organization by resolution A.789(19).

(b) platforms and drilling rigs engaged in voyages to waters under the sovereignty or jurisdiction of other Parties.

(2) A ship constructed before the date of entry into force of Annex VI for such ship's Administration shall be issued with an International Air Pollution Prevention Certificate in accordance with paragraph (1) of this regulation no later than the first scheduled dry-docking after the date of such entry into force, but in no case later than 3 years after this date.

(3) Such certificate shall be issued or endorsed either by the Administration or by any person or organization duly authorized by it. In every case, the Administration assumes full responsibility for the certificate.

Regulation 7
Issue of a Certificate by another Party

(1) A Party may, at the request of the Administration, cause a ship to be surveyed and, if satisfied that the provisions of this Annex are complied with, shall issue or authorize the issuance of an International Air Pollution Prevention Certificate to the ship, and where appropriate, endorse or authorize the endorsement of that certificate on the ship, in accordance with this Annex.

(2) A copy of the certificate and a copy of the survey report shall be transmitted as soon as possible to the requesting Administration.

(3) A certificate so issued shall contain a statement to the effect that it has been issued at the request of the Administration and it shall have the same force and receive the same recognition as a certificate issued under regulation 5 of this Annex.

(4) No International Air Pollution Prevention Certificate shall be issued to a ship which is entitled to fly the flag of a State which is not a Party.

Regulation 8
Form of Certificate

The International Air Pollution Prevention Certificate shall be drawn up in a form corresponding to the model given in appendix I to this Annex and shall be at least in English, French or Spanish. If an official language of the issuing country is also used, this shall prevail in case of a dispute or discrepancy.

Regulation 9
Duration and Validity of Certificate

(1) An International Air Pollution Prevention Certificate shall be issued for a period specified by the Administration, which shall not exceed five years.

(2) (a) Notwithstanding the requirements of paragraph (1) of this regulation, when the renewal survey is completed within three months before the expiry date of the existing certificate, the new certificate shall be valid from the date of completion of the renewal survey to a date not exceeding five years from the date of expiry of the existing certificate;

(b) When the renewal survey is completed after the expiry date of the existing certificate, the new certificate shall be valid from the date of completion of the renewal survey to a date not exceeding five years from the date of expiry of the existing certificate; and

(c) When the renewal survey is completed more than three months before the expiry date of the existing certificate, the new certificate shall be valid from the date of completion of the renewal survey to a date not exceeding five years from the date of completion of the renewal survey.

(3) If a certificate is issued for a period of less than five years, the Administration may extend the validity of the certificate beyond the expiry date to the maximum period specified in paragraph (1) of this regulation, provided that the surveys referred to in regulations 5(1)(c) and 5(1)(d) of this Annex applicable when a certificate is issued for a period of five years are carried out as appropriate.

(4) If a renewal survey has been completed and a new certificate cannot be issued or placed on board the ship before the expiry date of the existing certificate, the person or organization authorized by the Administration may endorse the existing certificate and such a certificate shall be accepted as valid for a further period which shall not exceed five months from the expiry date.

(5) If a ship, at the time when a certificate expires, is not in a port in which it is to be surveyed, the Administration may extend the period of validity of the certificate but this extension shall be granted only for the purpose of allowing the ship to complete its voyage to the port in which it is to be surveyed, and then only in cases where it appears proper and reasonable to do so. No certificate shall be extended for a period longer than three months, and a ship to which an extension is granted shall not, on its arrival in the port in which it is to be surveyed, be entitled by virtue of such extension to leave that port without having a new certificate. When the renewal survey is completed, the new certificate shall be valid to a date not exceeding five years from the date of expiry of the existing certificate before the extension was granted.

(6) A certificate issued to a ship engaged on short voyages which has not been extended under the foregoing provisions of this regulation may be extended by the Administration for a period of grace of up to one month from the date of expiry stated on it. When the renewal survey is completed, the new certificate shall be valid to a date not exceeding five years from the date of expiry of the existing certificate before the extension was granted.

(7) In special circumstances, as determined by the Administration, a new certificate need not be dated from the date of expiry of the existing certificate as required by paragraph (2)(b), (5) or (6) of this regulation. In these special circumstances, the new certificate shall be valid to a date not exceeding five years from the date of completion of the renewal survey.

(8) If an annual or intermediate survey is completed before the period specified in regulation 5 of this Annex, then:

(a) the anniversary date shown on the certificate shall be amended by endorsement to a date which shall not be more than three months later than the date on which the survey was completed;

(b) the subsequent annual or intermediate survey required by regulation 5 of this Annex shall be completed at the intervals prescribed by that regulation using the new anniversary date; and

(c) the expiry date may remain unchanged provided one or more annual or intermediate surveys, as appropriate, are carried out so that the maximum intervals between the surveys prescribed by regulation 5 of this Annex are not exceeded.

(9) A certificate issued under regulations 6 or 7 of this Annex shall cease to be valid in any of the following cases:

(a) if the relevant surveys are not completed within the periods specified under regulation 5(1) of this Annex;

(b) if the certificate is not endorsed in accordance with regulation 5(1)(c) or 5(1)(d) of this Annex; and

(c) upon transfer of the ship to the flag of another State. A new certificate shall only be issued when the Government issuing the new certificate is fully satisfied that the ship is in compliance with the requirements of regulation 5(4)(a) of this Annex. In the case of a transfer between Parties, if requested within three months after the transfer has taken place, the Government of the Party whose flag the ship was formerly entitled to fly shall, as soon as possible, transmit to the Administration copies of the certificate carried by the ship before the transfer and, if available, copies of the relevant survey reports.

Regulation 10
Port State Control on Operational Requirements

(1) A ship, when in a port or an offshore terminal under the jurisdiction of another Party, is subject to inspection by officers duly authorized by such Party concerning operational requirements under this Annex, where there are clear grounds for believing that the master or crew are not familiar with essential shipboard procedures relating to the prevention of air pollution from ships.

(2) In the circumstances given in paragraph (1) of this regulation, the Party shall take such steps as will ensure that the ship shall not sail until the situation has been brought to order in accordance with the requirements of this Annex.

(3) Procedures relating to the port State control prescribed in article 5 of the present Convention shall apply to this regulation.

(4) Nothing in this regulation shall be construed to limit the rights and obligations of a Party carrying out control over operational requirements specifically provided for in the present Convention.

Regulation 11
Detection of Violations and Enforcement

(1) Parties shall co-operate in the detection of violations and the enforcement of the provisions of this Annex, using all appropriate and practicable measures of detection and environmental monitoring, adequate procedures for reporting and accumulation of evidence.

(2) A ship to which this Annex applies may, in any port or offshore terminal of a Party, be subject to inspection by officers appointed or authorized by that Party for the purpose of verifying whether the ship has emitted any of the substances covered by this Annex in violation of the provision of this Annex. If an inspection indicates a violation of this Annex, a report shall be forwarded to the Administration for any appropriate action.

(3) Any Party shall furnish to the Administration evidence, if any, that the ship has emitted any of the substances covered by this Annex in violation of the provisions of this Annex. If it is practicable to do so, the competent authority of the former Party shall notify the master of the ship of the alleged violation.

(4) Upon receiving such evidence, the Administration so informed shall investigate the matter, and may request the other Party to furnish further or better evidence of the alleged contravention. If the Administration is satisfied that sufficient evidence is available to enable proceedings to be brought in respect of the alleged violation, it shall cause such proceedings to be taken in accordance with its law as soon as possible. The Administration shall promptly inform the Party which has reported the alleged violation, as well as the Organization, of the action taken.

(5) A Party may also inspect a ship to which this Annex applies when it enters the ports or offshore terminals under its jurisdiction, if a request for an investigation is received from any Party together with sufficient evidence that the ship has emitted any of the substances covered by the Annex in any place in violation of this Annex. The report of such investigation shall be sent to the Party requesting it and to the Administration so that the appropriate action may be taken under the present Convention.

(6) The international law concerning the prevention, reduction, and control of pollution of the marine environment from ships, including that law relating to enforcement and safeguards, in force at the time of application or interpretation of this Annex, applies, *mutatis mutandis*, to the rules and standards set forth in this Annex.

CHAPTER III
REQUIREMENTS FOR CONTROL OF EMISSIONS FROM SHIPS

Regulation 12
Ozone Depleting Substances

(1) This regulation does not apply to permanently sealed equipment where there are no refrigerant charging connections or potentially removable components containing Ozone Depleting Substances.

(2) Subject to the provisions of regulation 3, any deliberate emissions of ozone depleting substances shall be prohibited. Deliberate emissions include emissions occurring in the course of maintaining, servicing repairing or disposing of systems or equipment, except that deliberate emissions do not include minimal releases associated with the recapture or recycling of an ozone depleting substance. Emissions arising from leaks of an ozone depleting substance, whether or not the leaks are deliberate, may be regulated by Parties.

(3) (a) Installations which contain ozone depleting substances shall be prohibited:

(i) on ships constructed on or after 19 May 2005; or

(ii) in the case of ships constructed before 19 May 2005, which have a contractual delivery date of the equipment to the ship on or after 19 May 2005 or, in the absence of a contractual delivery date, the actual delivery of the equipment to the ship on or after 19 May 2005.

(b) Installations which contain hydro-chlorofluorocarbons shall be prohibited:

(i) on ships constructed on or after 1 January 2020; or

(ii) in the case of ships constructed before 1 January 2020, which have a contractual delivery date of the equipment to the ship on or after 1 January 2020 or, in the absence of a contractual delivery date, the actual delivery of the equipment to the ship on or after 1 January 2020.

(4) The substances referred to in this regulation, and equipment containing such substances, shall be delivered to appropriate reception facilities when removed from ships.

(5) Subject to this regulation, each ship shall maintain a list of equipment containing ozone depleting substances.[1]

(6) Every ship of 400 gross tonnage and above which has rechargeable systems that contain Ozone Depleting Substances shall maintain an Ozone Depleting Substances Record Book. This Record Book may form part of an existing log book.

[1] *See* Annex VI, as amended, Appendix I, Supplement to International Air Pollution Prevention Certificate (IAPP Certificate), section 2.1.

(7) Entries in the Ozone Depleting Substances Record Book shall be recorded in terms of mass (kg) of substance and shall be completed without delay on each occasion, in respect of the following:

(a) recharge, full or partial, of equipment containing ozone depleting substances;

(b) repair or maintenance of equipment containing ozone depleting substances;

(c) discharge of ozone depleting substances to the atmosphere:

(i) deliberate; and

(ii) non-deliberate;

(d) discharge of ozone depleting substances to land-based reception facilities; and

(e) supply of ozone depleting substances to the ship.

Regulation 13
Nitrogen Oxides (NOx)

Application

(1) (a) This regulation shall apply to:

(i) each diesel engine with a power output of more than 130 kW;

[(ii) Option 1: *each diesel engine [with a power output of more than 130 kW] with a displacement per cylinder at or above [[30][60] litres]* [which is installed on a ship constructed on or after 1 January 1990 and prior to 1 January 2000]]; and

[(ii) Option 2: *each diesel engine which is subject to paragraph 7 of this regulation]*; and

(ii[i]) each diesel engine with a power output of more than 130 kW which undergoes a major conversion except when demonstrated to the satisfaction of the Administration that the engine is an identical replacement to the engine which it is replacing and is otherwise not covered under subparagraph (i) of paragraph 1(a) of this regulation.

(b) This regulation does not apply to:

(i) a diesel engine intended to be used solely for emergencies, or solely to power any device or equipment intended to be used solely for emergencies on the ship on which it is installed, or a diesel engine installed in lifeboats intended to be used solely for emergencies; and

(ii) a diesel engine installed on a ship solely engaged in voyages within waters subject to the sovereignty or jurisdiction of the State the flag of which the ship is entitled to fly, provided that such an engine is subject to an alternative NOx control measure established by the Administration.

(c) Notwithstanding the provisions of (a) of this paragraph, the Administration may provide an exclusion from the application of this regulation for any diesel engine which is installed on a ship constructed, or for any diesel engine which undergoes a major conversion, before 19 May 2005, provided that the ship on which the engine is installed is solely engaged in voyages to ports or offshore terminals within the State the flag of which the ship is entitled to fly.

(2) (a) For the purpose of this regulation, "major conversion" means a modification of a diesel engine that has not already been certified to the standards set forth in paragraphs 3, 4, or 6 of this regulation where:

(i) the engine is replaced by a diesel engine, or

(ii) any substantial modification, as defined in the NOx Technical Code, is made to the engine, or

(iii) the maximum continuous rating of the engine is increased by more than 10% compared to the maximum continuous rating of the original certification of the engine.

(b) For a major conversion involving the replacement of an existing engine with a non-identical engine or the installation of an additional engine, the standards in this regulation in force at the time of the replacement or addition of an engine shall apply. On or after 1 January 2016, in the case of replacement engines only, if it is not possible for such a replacement engine to meet the standards set forth in paragraph 5 of this regulation (Tier III), then that replacement engine shall meet the standards set forth in paragraph 4 of this regulation (Tier II). Guidelines are to be developed by the Organization to set forth the criteria of when it is not possible for a replacement engine to meet the standards in paragraph 5 of this regulation.

(c) For an engine referred to in subparagraph (ii) or (iii) of this paragraph 2(a), then the engine shall meet the standards that are:

(i) for ships constructed prior to 1 January 2000, the standards set forth in paragraph 3 of this regulation shall apply; and

(ii) for ships constructed on or after 1 January 2000, the standards in force at the time the ship is constructed shall apply.

Tier I ***Note: This is the existing 17 g/kW standard in Annex VI.***

(3) Subject to regulation 3 of this Annex, the operation of a diesel engine which is installed on a ship constructed on or after 1 January 2000 and prior to 1 January 2011 is prohibited, except when the emission of nitrogen oxides (calculated as the total weighted emission of NO_2) from the engine is within the following limits, where n = rated engine speed (crankshaft revolutions per minute):

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

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

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

Tier II[2]

(4) Subject to regulation 3 of this Annex, the operation of a diesel engine which is installed on a ship constructed on or after 1 January 2011 is prohibited, except when the emission of nitrogen oxides (calculated as the total weighted emission of NO_2) from the engine is within the following limits, where n = rated engine speed (crankshaft revolutions per minute):

(a) 14.36 g/kWh when n is less than 130 rpm;

(b) 44 *n(-0.23) g/kWh when n is 130 or more but less than 2000 rpm; or

(c) 7.66 g/kWh when n is 2000 rpm or more.

Tier III

(5) (a) Subject to regulation 3 of this Annex, the operation of a diesel engine with a power output of more than 600kW which is installed on a ship constructed on or after 1 January 2016**:**

(i) notwithstanding sub-paragraph (a)(i) of paragraph 1 of this regulation, paragraphs 5 and 6 of this regulation shall only apply to each diesel engine with a power output of more than 600kW; however, such paragraphs may, at the discretion of a Party, apply to diesel engines with a power output of more than 130kW;

(ii) is prohibited except when the emission of nitrogen oxides (calculated as the total weighted emission of NO_2) from the engine is within the following limits, where n = rated engine speed (crankshaft revolutions per minute):

(a) 3.40 g/kWh when n is less than 130 rpm;

(b) 9 *n(-0.2) g/kWh when n is 130 or more but less than 2000 rpm; and

(c) 1.96 g/kWh when n is 2000 rpm or more; and

(iii) is subject to the standard[s] set forth in subparagraph (i) of this paragraph when the ship is operating [in an Emission Control Area set forth in, or designated under, paragraph 6 of this regulation].

[2] Tier II is for ships constructed on or after 1 January 2011 to prior to 1 January 20[15][16].

(b) For a diesel engine which is installed on a ship constructed on or after 1 January 2016, the standards set forth in paragraph 4 of this regulation shall apply when the ship is operating outside of such a designated Emission Control Area.

(6) For the purpose of this regulation, Emission Control Areas shall include:

(a) …; and

(b) any other sea area, including port areas, designated by the Organization in accordance with the criteria and procedures set forth in Appendix III to this Annex.

Engines Installed on a Ship Constructed Prior to 1 January 2000[3]

[(7) Option 1:

(a) Subject to regulation 3 of this Annex, the operation of a diesel engine [with per cylinder displacement at or above [30/60/90 litres] [with a power output of more than 5000 kW], which is installed on a ship constructed on or after 1 January 1990 and prior to 1 January 2000 is prohibited, except when the emission of nitrogen oxides (calculated as the total weighted emission of NO_2) from the engine is:

(i) 17.0g/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; and

(iii) 9.8 g/kWh when n is 2000 rpm or more];

where n = rated engine speed (crankshaft revolutions per minute);

(b) An engine to which subparagraph (a) of this paragraph applies shall comply with the standard[s] set forth in that subparagraph not later than the first intermediate or renewal survey, whichever occurs later[, beginning on 1 January 2010]; and

(c) If an engine cannot comply with the standards set forth in paragraph (a) of this paragraph, a port State may:

(i) require a ship to use distillate fuel[3]; or

(ii) subject to the provisions of international law, deny entry to a ship into its ports or offshore terminals under its jurisdiction, except when it is necessary for the purpose of securing the safety of a ship or saving life at sea. In such cases, that Party shall communicate to the Organization for circulation to the Parties particulars thereof for their information.]

[3] If this Option is accepted, consideration should be given to what grade of distillate fuel should be required. Area issues should also be considered.

[(7) Option 2[4]

a) A diesel engine [with per cylinder displacement at or above [30/60/90] litres] [with a power output of more than 5000 kW] installed on a ship constructed on or after 1 January 1990 and prior to 1 January 2000 shall comply with the NOx limits set forth in subparagraph (f) of this paragraph if a certified emission upgrade kit is available for that engine.

b) An emission upgrade kit will be considered to be available [12] months after [an Administration] [the Administration of the country of the engine designer][an Administration with is a Annex VI party][the flag Administration] deposits to the Organization a notification (including a list of the models to which the emission upgrade kit applies) that it has certified such a kit as complying with the limits in f) and the following conditions have been satisfied:

i) The engine designer attests that the emission upgrade kit will not have an adverse impact on engine rating [GT 1%] , fuel consumption [GT 2%], durability and reliability [as evidenced by a circular letter from the engine designer] and the efficiency of the engine (more than [XX%]); and

ii) The manufacture of the emission upgrade kit attests that the price of the kit, including installation and incremental changes in engine operation costs, does not exceed [ABSOLUTE VALUE/VALUE per ton of NOx reduced].

c) If a owner can demonstrate to the satisfaction of the flag Administration of the ship onto which the kit is to be installed that an emission upgrade kit will not be available through normal business practices at the time the kit must be installed then the emission upgrade kit will, notwithstanding (b), be considered to be not available.

d) An engine to which this paragraph applies shall comply with the standards set forth in (f) no later than the at the first intermediate or renewal survey (whichever occurs later) required in regulation 5 after an emission upgrade kit becomes available for that engine pursuant to subparagraphs (b) and (c). A shipowner may request an extension of this period to the first scheduled drydocking after the kit becomes available in those cases where the kit manufacturer specifies that installation of the emission upgrade kit requires taking the engine out of service.

e) The IAPP for a ship with an engine for which an emission upgrade kit is available will be revised to indicate that the engine is subject to the requirements of this regulation.

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[4] Availability of emission upgrade kits will depend on the market. Therefore, it may be necessary to create incentives for ship owners to request manufacturers to supply such kits. Incentives that may help the introduction and certification of emission upgrade kits; these may include fairway dues, port fee structures, or requirements to use alternative control technologies or operational requirements while operating within specified areas, including speed reductions, use of distillate fuels.

In lieu of a Tier 1 NOx limits, consideration should be given to an approach that would require emission upgrade kits to comply with either Tier 1 NOx limits or a 20 percent reduction in measured NOx emissions, [whichever is larger].

f) Subject to regulation 3 of this Annex and for those engines to which this paragraph applies, the operation of an existing engine is prohibited, except when the emission of nitrogen oxides (calculated as the total weighted emission of NO_2) from the engine is within or does not exceed the following limits, where n = rated engine speed (crankshaft revolutions per minute):

i) 17.0 g/kW 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].

Alternatives

(8) Notwithstanding paragraphs 3, 4, 5 and 7 of this regulation, the operation of a diesel engine is permitted when:

(i) an exhaust gas cleaning system, approved by the Administration in accordance with the NOx Technical Code, is applied to the engine to reduce onboard NOx emissions at least to the limits specified in paragraphs 3, 4, 5, and 7 of this regulation; or

(ii) any other equivalent method, approved by the Administration taking into account relevant guidelines to be developed by the Organization, is applied to reduce onboard NOx emissions at least to the limit specified in paragraphs 3, 4, 5, and 7 of this regulation.

Certification

(9) The certification, testing, and measurement procedures for the standards set forth in this regulation, are set forth in the NOx Technical Code.

(10) The procedures for determining NOx emissions set out in the NOx Technical Code are intended to be representative of the normal operation of the engine. Defeat devices and irrational emission control strategies undermine this intention and shall not be allowed. This regulation shall not prevent the use of auxiliary control devices that are used to protect the engine and/or its ancillary equipment against operating conditions that could result in damage or failure or that are used to facilitate the starting of the engine.

Review

(11) No later than [4] years before the standards in paragraph 5 of this regulation enter into force, the Organization shall review the status of the technological developments to implement those standards and shall take any action it determines necessary.

Regulation 14
Sulphur Oxides (SOx) and Particulate Matter (PM)

Option 1: Global Approach

Regulation 14
Sulphur Oxides (SOx) and Particulate Matter (PM)

General requirements

(1) The sulphur content of any fuel oil used on board ships shall not exceed:

(i) 4.50% m/m;

(ii) 1.00% m/m on or after 1 January 201[2]; and

(iii) 0.50% m/m on or after 1 January 201[5].

(2) The worldwide average sulphur content of residual fuel oil supplied for use on board ships shall be monitored taking into account guidelines developed by the Organization.[5]

Requirements within Emission Control Areas

(3) For the purpose of this regulation, Emission Control Areas shall exist until 1 January 201[2] for the reduction of SOx and PM emissions and shall include:

(a) the Baltic Sea area as defined in regulation 10(1)(b) of Annex I, the North Sea as defined in regulation 5(1)(f) of Annex V; and

(b) any other sea area, including port areas, designated by the Organization in accordance with criteria and procedures set forth in appendix III to this Annex.

(4) Prior to 1 January 201[2], while ships are within an Emission Control Area, at least one of the following conditions shall be fulfilled:

(a) the sulphur content of fuel oil used on board ships in a Emission Control Area does not exceed 1.50% m/m;

(b) an exhaust gas cleaning system, approved by the Administration taking into account guidelines to be developed by the Organization,[6] is applied to reduce the total emission of SOx and PM from ships, including both auxiliary and main propulsion engines, to 6.0 g SOx/kWh or less calculated as the total weight of sulphur dioxide emission; or

(c) any other technological method that is verifiable and enforceable to limit SOx and PM emissions to a level equivalent to that described in subparagraphs (a) or (b) is applied. These methods shall be approved by the Administration taking into account guidelines to be developed by the Organization.

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5 MEPC.82(43), "Guidelines for Monitoring the World-wide Average Sulphur Content of Residual Oils Supplied for Use On Board Ships".

6 MEPC.xx(xx), "Guidelines for Exhaust Gas Cleaning Systems".

(d) Waste streams from the use of such equipment pursuant to subparagraphs (b) and (c) of this paragraph (4) shall not be discharged into ports, harbours and estuaries unless it can be thoroughly documented by the ship that such waste streams have no adverse impact on the ecosystems of such ports, harbours and estuaries, based upon criteria communicated by the authorities of the port State to the Organization. The Organization shall circulate the criteria to all Parties.

(5) The sulphur content of fuel oil referred to in paragraphs (1) and (4)(a) of this regulation shall be documented by the supplier as required by regulation 18 of this Annex.

(6) Those ships using separate fuel oils to comply with paragraph (4)(a) of this regulation shall carry a written procedure showing how the fuel change-over is to be done, allowing sufficient time for the fuel oil service system to be fully flushed of all fuels exceeding the 1.50% m/m sulphur content specified in paragraph (a) of paragraph 4 prior to entry into an Emission Control Area. The volume of low sulphur fuel oils (less than or equal to 1.50% sulphur content) in each tank as well as the date, time, and position of the ship when any fuel-change-over operation is completed prior to the entry into a Emission Control Area or commenced after exit from such an area, shall be recorded in such log-book as may be prescribed by the Administration.

(7) During the first twelve months immediately following amendment to the present Protocol designating a specific Emission Control Area under paragraph (3)(b) of this regulation, ships operating in an Emission Control Area designated under paragraph (3)(b) of this regulation are exempted from the requirements in paragraphs (4) and (6) of this regulation and from the requirements of paragraph (5) of this regulation insofar as they relate to paragraph (4)(a) of this regulation.

[(8) A port State that establishes additional measures to address air emissions from ships must notify the Organization at least 6 months prior to the effective date of such requirements.]

Option 2: Change to Emission Control Area requirement

Regulation 14
Sulphur Oxides (SOx) and Particulate Matter (PM)

General requirements

(1) The sulphur content of any fuel oil used on board ships shall not exceed 4.50% m/m.

(2) The worldwide average sulphur content of residual fuel oil supplied for use on board ships shall be monitored taking into account guidelines developed by the Organization.[7]

Requirements within Emission Control Areas

(3) For the purpose of this regulation, Emission Control Areas shall include:

(a) the Baltic Sea area as defined in regulation 10(1)(b) of Annex I, the North Sea as defined in regulation 5(1)(f) of Annex V; and

[7] MEPC.82(43), "Guidelines for Monitoring the World-wide Average Sulphur Content of Residual Oils Supplied for Use On Board Ships".

(b) any other sea area, including port areas, designated by the Organization in accordance with criteria and procedures set forth in appendix III to this Annex.

(4) While ships are within Emission Control Areas, at least one of the following conditions shall be fulfilled:

(a) the sulphur content of fuel oil used on board ships in an Emission Control Area shall not exceed the following limitations:

(i) 1.50% m/m; and

(ii) 0.10% m/m on and after 1 January 201[2];

(b) an exhaust gas cleaning system, approved by the Administration taking into account guidelines to be developed by the Organization,[8] is applied to reduce the total emission of SOx and PM from ships, including both auxiliary and main propulsion engines, to the following levels or less:

(i) 6.0 g SOx/kWh or less calculated as the total weight of sulphur dioxide emission; and

(ii) 0.4 g SOX/kWh or less calculated as the total weight of sulphur dioxide emissions on and after 1 January 201[2]; or

(c) any other technological method that is verifiable and enforceable to limit SOx and PM emissions to a level equivalent to that described in subparagraphs (a) or (b) is applied. These methods shall be approved by the Administration taking into account guidelines to be developed by the Organization.

(d) Waste streams from the use of such equipment pursuant to subparagraph (b) and (c) of this paragraph 4 shall not be discharged into ports, harbours and estuaries unless it can be thoroughly documented by the ship that such waste streams have no adverse impact on the ecosystems of such ports, harbours and estuaries, based upon criteria communicated by the authorities of the port State to the Organization. The Organization shall circulate the criteria to all Parties.

(5) The sulphur content of fuel oil referred to in paragraph (1) and paragraph (4)(a) of this regulation shall be documented by the supplier as required by regulation 18 of this Annex.

(6) Those ships using separate fuel oils to comply with paragraph (4)(a) of this regulation shall carry a written procedure showing how the fuel change-over is to be done, allowing sufficient time for the fuel oil service system to be fully flushed of all fuels exceeding the applicable sulphur content specified in subparagraph (a) of paragraph 4 of this regulation prior to entry into an Emission Control Area. The volume of low sulphur fuel oils in each tank as well as the date, time, and position of the ship when any fuel-change-over operation is completed prior to the entry into an Emission Control Area or commenced after exit from such an area, shall be recorded in such log-book as prescribed by the Administration.

[8] *MEPC.xx(xx),* "*Guidelines for Exhaust Gas Cleaning Systems*".

(7) During the first twelve months immediately following amendment to the present Protocol designating a specific Emission Control Area under paragraph (3)(b) of this regulation, ships operating in an Emission Control Area designated under paragraph (3)(b) of this regulation are exempted from the requirements in paragraphs (4) and (6) of this regulation and from the requirements of paragraph (5) of this regulation insofar as they relate to paragraph (4)(a) of this regulation.

[(8) A port State that establishes additional measures to address air emissions from ships must notify the Organization at least 6 months prior to the effective date of such requirements.]

Option 3: Emission Control Area/Micro-Emission Control Areas/Global Cap

Regulation 14
Sulphur Oxides (SOx) and Particulate Matter (PM)

General requirements

(1) The sulphur content of any fuel oil used on board ships shall not exceed:

(i) 4.50% m/m; and

(ii) 3.00% m/m on or after 1 January 201[2].

(2) The worldwide average sulphur content of residual fuel oil supplied for use on board ships shall be monitored taking into account guidelines developed by the Organization.[9]

Requirements within Emission Control Areas

(3) For the purpose of this regulation, Emission Control Areas shall include:

(a) the Baltic Sea area as defined in regulation 10(1)(b) of Annex I, the North Sea as defined in regulation 5(1)(f) of Annex V; and

(b) any other sea area, including port areas, designated by the Organization in accordance with criteria and procedures set forth in appendix III to this Annex.

(4) While ships are within an Emission Control Area, at least one of the following conditions shall be fulfilled:

(a) the sulphur content of fuel oil used on board ships in a Emission Control Area shall not exceed:

(i) 1.50% m/m;

(ii) 1.00% m/m on and after 1 January 201[0]; and

(iii) 0.50% m/m on and after 1 January 201[5];

[9] MEPC.82(43), "Guidelines for Monitoring the World-wide Average Sulphur Content of Residual Oils Supplied for Use On Board Ships".

(b) an exhaust gas cleaning system, approved by the Administration taking into account guidelines to be developed by the Organization,[10] is applied to reduce the total emission of SOx and PM from ships, including both auxiliary and main propulsion engines, to the following levels or less:

(i) 6.0 g SOx/kWh or less calculated as the total weight of sulphur dioxide emission;

(ii) 4.0 g SOX/kWh or less calculated as the total weight of sulphur dioxide emissions on and after 1 January 201[0]; and

(iii) 2.0 g SOX/kWh or less calculated as the total weight of sulphur dioxide emissions on and after 1 January 201[5]; or

(c) any other technological method that is verifiable and enforceable to limit SOx and PM emissions to a level equivalent to that described in subparagraphs (a) and (b) is applied. These methods shall be approved by the Administration taking into account guidelines to be developed by the Organization; and

(d) Waste streams from the use of such equipment pursuant to subparagraph (b) and (c) of this paragraph 4 shall not be discharged into ports, harbours and estuaries unless it can be thoroughly documented by the ship that such waste streams have no adverse impact on the ecosystems of such ports, harbours and estuaries, based upon criteria communicated by the authorities of the port State to the Organization. The Organization shall circulate the criteria to all Parties.

Requirements within Micro-Emission Control Areas

(5) For the purpose of this regulation, Micro-Emission Control Areas shall be not more than [24] nautical miles from shore and shall include any sea area, including port areas, [designated] by the Organization in accordance with criteria and procedures set forth in appendix III to this Annex.[11]

(6) While ships are within a Micro-Emission Control Area, at least one of the following conditions shall be fulfilled:

(a) the sulphur content of fuel oil used on board ships in a Mirco-Emission Control Area shall not exceed 0.10 m/m;

(b) an exhaust gas cleaning system, approved by the Administration taking into account guidelines to be developed by the Organization,[12] is applied to reduce the total emission of SOx and PM from ships, including both auxiliary and main propulsion engines, to 0.4 g SOX/kWh or less calculated as the total weight of sulphur dioxide emissions; or

[10] MEPC.xx(xx), "Guidelines for Exhaust Gas Cleaning Systems".
[11] Relaxation of the criteria and procedures in Appendix III (or a new Appendix developed) needs to be further considered if this Option is pursued.
[12] MEPC.xx(xx), "Guidelines for Exhaust Gas Cleaning Systems".

(c) any other technological method that is verifiable and enforceable to limit SOx and PM emissions to a level equivalent to that described in subparagraphs (a) and (b) is applied. These methods shall be approved by the Administration taking into account guidelines to be developed by the Organization.

(d) Waste streams from the use of such equipment pursuant to subparagraph (b) and (c) of this paragraph 4 shall not be discharged into ports, harbours and estuaries unless it can be thoroughly documented by the ship that such waste streams have no adverse impact on the ecosystems of such ports, harbours and estuaries, based upon criteria communicated by the authorities of the port State to the Organization. The Organization shall circulate the criteria to all Parties.

(7) The sulphur content of fuel oil referred to in paragraph (1) and paragraphs (4)(a) and 6(a) of this regulation shall be documented by the supplier as required by regulation 18 of this Annex.

(8) Those ships using separate fuel oils to comply with subparagraphs (4)(a) and 6(a) of this regulation shall carry a written procedure showing how the fuel change-over is to be done, allowing sufficient time for the fuel oil service system to be fully flushed of all fuels exceeding the applicable sulphur content specified in subparagraph (a) of paragraphs 4 and 6 of this regulation prior to entry into an Emission Control Area or Micro-Emission Control Area. The volume of low sulphur fuel oils in each tank as well as the date, time, and position of the ship when any fuel-change-over operation is completed prior to the entry into an Emission Control Area or Micro-Emission Control Area or commenced after exit from such an area, shall be recorded in such log-book as prescribed by the Administration.

(9) During the first twelve months immediately following amendment to the present Protocol designating a specific Emission Control Area or Micro-Emission Control Area under paragraphs (3)(b) or 5 of this regulation, ships operating in an Emission Control Area or Micro-Emission Control Area designated under paragraphs (3)(b) or 5 of this regulation are exempted from the requirements in paragraphs (4), (6) and (8) of this regulation and from the requirements of paragraph (7) of this regulation insofar as they relate to paragraphs (4)(a) and (6)(a) of this regulation.

[(10) A port State that establishes additional measures to address air emissions from ships must notify the Organization at least 6 months prior to the effective date of such requirements.][13]

Definition

"Micro-Emission Control Area" means an area where the adoption of special mandatory measures for emissions from ships is required to prevent, reduce and control air pollution and its attendant adverse impacts on human health and the environment. Micro-Emission Control Areas shall include those [designated] under, regulation 14(5) of this Annex.

Regulation 15
Volatile Organic Compounds (VOCs)

(1) If the emissions of VOCs from a tanker are to be regulated in a port or ports or a terminal or terminals under the jurisdiction of a Party, they shall be regulated in accordance with the provisions of this regulation.

[13] This paragraph may have a specific relationship to the Micro-Emission Control Areas concept and should be further considered.

(2) A Party regulating tankers for VOC emissions shall submit a notification to the Organization. This notification shall include information on the size of tankers to be controlled, the cargoes requiring vapour emission control systems, and the effective date of such control. The notification shall be submitted at least six months before the effective date.

(3) A Party which designates ports or terminals at which VOCs emissions from tankers are to be regulated shall ensure that vapour emission control systems, approved by that Party taking into account the safety standards for such systems developed by the Organization,[14] are provided in any designated port and terminal and are operated safely and in a manner so as to avoid undue delay to a ship.

(4) The Organization shall circulate a list of the ports and terminals designated by Parties to other Parties and Member States of the Organization for their information.

(5) A tanker to which paragraph 1 of this regulation applies shall be provided with a vapour emission collection system approved by the Administration taking into account the safety standards for such systems developed by the Organization,[15] and shall use this system during the loading of relevant cargoes. A port or terminal which has installed vapour emission control systems in accordance with this regulation may accept tankers which are not fitted with vapour collection systems for a period of three years after the effective date identified in paragraph (2) of this regulation.

(6) A tanker carrying crude oil shall have onboard and implement a VOC management plan approved by the Administration. Such a plan shall be prepared taking into account the guidelines[16] developed by the Organization. The plan shall be specific to each ship and shall at least:

(a) provide written procedures for minimizing VOC emissions during the loading, sea passage, and discharge of cargo;

(b) give consideration to the extra VOC generated by crude oil washing;

(c) identify a person responsible for implementing the plan; and

(d) for ships on international voyages, be written in the working language of the master and officers and, if the working language of the master and officers is not English, French, or Spanish, include a translation into one of these languages.

(7) This regulation shall also apply to gas carriers only if the type of loading and containment systems allow safe retention of non-methane VOCs on board or their safe return ashore.[17]

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[14] MSC/Circ.585.
[15] MSC/Circ 585.
[16] MEPC.[xx][(xx)], "Guidelines for the Development of a VOC Management Plan".
[17] MSC.30(61), "International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk", Chapter 5.

Regulation 16
Shipboard Incineration

(1) Except as provided in paragraph (4) of this regulation, shipboard incineration shall be allowed only in a shipboard incinerator.

(2) Shipboard incineration of the following substances shall be prohibited:

(a) residues of cargoes subject to Annex I, II and III of the present Convention or related contaminated packing materials;

(b) polychlorinated biphenyls (PCBs);

(c) garbage, as defined by Annex V of the present Convention, containing more than traces of heavy metals;

(d) refined petroleum products containing halogen compounds~~[~~**;**

(e) sewage sludge and sludge oil either of which are not generated on board the ship; and

(f) exhaust gas cleaning system residues.

(3) Shipboard incineration of polyvinyl chlorides (PVCs) shall be prohibited, except in shipboard incinerators for which IMO Type Approval Certificates* have been issued.

(4) Shipboard incineration of sewage sludge and sludge oil generated during normal operation of a ship may also take place in the main or auxiliary power plant or boilers, but in those cases, shall not take place inside ports, harbours and estuaries.

(5) Nothing in this regulation either:

(a) affects the prohibition in, or other requirements of, the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972, as amended, and the 1996 Protocol thereto, or

(b) precludes the development, installation and operation of alternative design shipboard thermal waste treatment devices that meet or exceed the requirements of this regulation.

(6) (a) Except as provided in (b) of this paragraph, each incinerator on a ship constructed on or after 1 January 2000 or incinerator which is installed onboard a ship on or after 1 January 2000 shall meet the requirements contained in appendix IV to this Annex. Each incinerator subject to this shall be approved by the Administration taking into account the standard specifications for shipboard incinerators developed by the Organization**; and

* Type Certificates issued in accordance with resolutions MEPC.59(33) or MEPC.76(40).
** Refer to resolution MEPC.76(40), standard specification for shipboard incinerators.

(b) The Administration may allow exclusion from the application of (a) of this paragraph to any incinerator which is installed on board a ship before 19 May 2005, provided that the ship is solely engaged in voyages within waters subject to the sovereignty or jurisdiction of the State the flag of which the ship is entitled to fly.

(7) Incinerators installed in accordance with the requirements of paragraph 6(a) of this regulation shall be provided with a manufacturer's operating manual which is to be retained with the unit and which shall specify how to operate the incinerator within the limits described in paragraph 2 of appendix IV of this Annex.

(8) Personnel responsible for the operation of an incinerator shall be trained to implement the guidance provided in the manufacturer's operating manual as required by paragraph (7) of this regulation.

(9) For incinerators installed in accordance with the requirements of paragraph 8(a) of this regulation the combustion chamber gas outlet temperature shall be monitored at all times the unit is in operation. Where that incinerator is of the continuous-feed type, waste shall not be fed into the unit when the combustion chamber gas outlet temperature is below 850°C. Where that incinerator is of the batch-loaded type, the unit shall be designed so that the combustion chamber gas outlet temperature shall reach 600°C within five minutes after start-up and will thereafter stabilize at a temperature not less than 850°C.

Regulation 17
Reception Facilities

(1) Each Party undertakes to ensure the provision of facilities adequate to meet the:

(a) needs of ships using its repair ports for the reception of ozone depleting substances and equipment containing such substances when removed from ships;

(b) needs of ships using its ports, terminals or repair ports for the reception of exhaust gas cleaning residues from an approved exhaust gas cleaning system;

without causing undue delay to ships, and

(c) needs in ship breaking facilities for the reception of ozone depleting substances and equipment containing such substances when removed from ships.

(2) If exceptional circumstances exist in a particular port or terminal of a Party such that it is not equipped to handle the substances referred to in paragraph 1 of this regulation, then the Party shall inform the Organization of any such port or terminal so that this information may be circulated to all Parties for their information and any appropriate action.

(3) Each Party shall notify the Organization for transmission to the Members of the Organization of all cases where the facilities provided under this regulation are unavailable or alleged to be inadequate.

Regulation 18
Fuel Oil Quality

(1) Fuel oil for combustion purposes delivered to and used on board ships to which this Annex applies shall be fit for use and meet the following requirements:

(a) except as provided in (b):

(i) the fuel oil shall be blends of hydrocarbons derived from petroleum refining. This shall not preclude the incorporation of small amounts of additives intended to improve some aspects of performance;

(ii) the fuel oil shall be free from inorganic acid;

(iii) the fuel oil shall not include any added substance or chemical waste which either:

(1) jeopardizes the safety of ships or adversely affects the performance of the machinery, or

(2) is harmful to personnel, or

(3) contributes overall to additional air pollution; and

(b) fuel oil for combustion purposes derived by methods other than petroleum refining shall not:

(i) exceed the sulphur content set forth in regulation 14 of this Annex;

(ii) cause an engine to exceed the NOx emission limits set forth in regulation 13(3)(a) of this Annex;

(iii) contain inorganic acid; and

(iv) (1) jeopardize the safety of ships or adversely affect the performance of the machinery, or

(2) be harmful to personnel, or

(3) contribute overall to additional air pollution.

(2) This regulation does not apply to coal in its solid form or nuclear fuels.

(3) For each ship subject to regulations 5 and 6 of this Annex, details of fuel oil for combustion purposes delivered to and used on board shall be recorded by means of a bunker delivery note which shall contain at least the information specified in appendix V to this Annex.

(4) The bunker delivery note shall be kept on board the ship in such a place as to be readily available for inspection at all reasonable times. It shall be retained for a period of three years after the fuel oil has been delivered on board.

(5) (a) The competent authority of a Party may inspect the bunker delivery notes on board any ship to which this Annex applies while the ship is in its port or offshore terminal, may make a copy of each delivery note, and may require the master or person in charge of the ship to certify that each copy is a true copy of such bunker delivery note. The competent authority may also verify the contents of each note through consultations with the port where the note was issued; and

(b) The inspection of the bunker delivery notes and the taking of certified copies by the competent authority under this paragraph shall be performed as expeditiously as possible without causing the ship to be unduly delayed.

(6) (a) The bunker delivery note shall be accompanied by a representative sample of the fuel oil delivered taking into account guidelines developed by the Organization.[18] The sample is to be sealed and signed by the supplier's representative and the master or officer in charge of the bunker operation on completion of bunkering operations and retained under the ship's control until the fuel oil is substantially consumed, but in any case for a period of not less than twelve months from the time of delivery.

(b) If the Administration requires the representative sample to be analysed, it shall be done in accordance with the verification procedure set forth in appendix VI to determine whether the fuel oil meets the requirements of this annex.

(7) Parties undertake to ensure that appropriate authorities designated by them:

(a) maintain a register of local suppliers of fuel oil;

(b) require local suppliers to provide the bunker delivery note and sample as required by this regulation, certified by the fuel oil supplier that the fuel oil meets the requirements of regulations 14 and 18 of this Annex;

(c) require local suppliers to retain a copy of the bunker delivery note for at least three years for inspection and verification by the port State as necessary;

(d) take action as appropriate against fuel oil suppliers that have been found to deliver fuel oil that does not comply with that stated on the bunker delivery note;

(e) inform the Administration of any ship receiving fuel oil found to be non-compliant with the requirements of regulations 14 or 18 of this Annex; and

(f) inform the Organization for transmission to Parties of all cases where fuel oil suppliers have failed to meet the requirements specified in regulations 14 or 18 of this Annex.

[18] Refer to MEPC.96(47), "Guidelines for the sampling of fuel oil for determination of compliance with Annex VI of MARPOL 73/78."

(8) In connection with port State inspections carried out by Parties, the Parties further undertake to:

(a) inform the Party or non-Party under whose jurisdiction a bunker delivery note was issued of cases of delivery of noncompliant fuel oil, giving all relevant information; and

(b) ensure that remedial action as appropriate is taken to bring noncompliant fuel oil discovered into compliance.

(9) For every ship of 400 gross tonnage and above on scheduled services with frequent and regular port calls, an Administration may decide after application and consultation with affected States that compliance with paragraph (6) of this regulation may be documented in an alternative manner which gives similar certainty of compliance with regulations 14 and 18 of this Annex.

APPENDIX I

The first paragraph of Appendix I should read as follows:

Issued under the provisions of the Protocol of 1997 as amended, to amend the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 related thereto (hereinafter referred to as "the Convention") under the authority of the Government of:

The remaining part is omitted as there were no other proposed amendments

APPENDIX II

Omitted as there were no proposed amendments

APPENDIX III

CRITERIA AND PROCEDURES FOR DESIGNATION OF EMISSION CONTROL AREAS

1 OBJECTIVES

1.1 The purpose of this appendix is to provide the criteria and procedures to Parties for the formulation and submission of proposals for the designation of Emission Control Areas and to set forth the factors to be considered in the assessment of such proposals by the Organization.

1.2 Emissions of SOx, NOx, and particulate matter from ocean-going ships contribute to ambient concentrations of air pollution in cities and coastal areas around the world. Adverse public health and environmental effects associated with air pollution include premature mortality, cardiopulmonary disease, lung cancer, chronic respiratory ailments, acidification, and eutrophication.

1.3 An Emission Control Area should be considered for adoption by the Organization if supported by a demonstrated need to prevent, reduce, and control emissions of one or more of the following pollutants: SOx, NOx, and particulate matter (hereinafter emissions) from ships.

2 PROCESS FOR THE DESIGNATION OF EMISSION CONTROL AREAS

2.1 A proposal to the Organization for designation of an Emission Control Area may be submitted only by Parties. Where two or more Parties have a common interest in a particular area, they should formulate a co-ordinated proposal.

2.2 A proposal to designate a given area as an Emission Control Area should be submitted to the Organization in accordance with the rules and procedures established by the Organization.

3 CRITERIA FOR DESIGNATION OF AN EMISSION CONTROL AREA

3.1 The proposal shall include:

.1 a clear delineation of the proposed area of application, along with a reference chart on which the area is marked;

.2 a description of the human populations and environmental areas at risk from the impacts of ship emissions;

.3 an assessment that emissions from ships operating in the proposed area of application are contributing to ambient concentrations of air pollution or to adverse environmental impacts. Such assessment shall include a description of the impacts of the relevant emissions on human health and the environment, such as adverse impacts to terrestrial and aquatic ecosystems, areas of natural productivity, critical habitats, water quality, human health, and areas of cultural and scientific significance, if applicable. The sources of relevant data including methodologies used shall be identified;

.4 relevant information pertaining to the meteorological conditions in the proposed area of application to the human populations and environmental areas at risk, in particular prevailing wind patterns, or to topographical, geological, oceanographic, morphological, or other conditions that contribute to ambient concentrations of air pollution or adverse environmental impacts;

.5 the nature of the ship traffic in the proposed Emission Control Area, including the patterns and density of such traffic;

.6 a description of the control measures taken by the proposing Party or Parties addressing land-based sources of SOx, NOx and particulate matter emissions affecting the human populations and environmental areas at risk that are in place and operating concurrent with the consideration of measures to be adopted in relation to provisions of regulations 13 and 14 of Annex VI; and

.7 the relative costs of reducing emissions from ships when compared with land-based controls, and the economic impacts on shipping engaged in international trade.

3.2 The geographical limits of an Emission Control Area will be based on the relevant criteria outlined above, including emissions and deposition from ships navigating in the proposed area, traffic patterns and density, and wind conditions.

4 PROCEDURES FOR THE ASSESSMENT AND ADOPTION OF EMISSION CONTROL AREAS BY THE ORGANIZATION

4.1 The Organization shall consider each proposal submitted to it by a Party or Parties.

4.2 In assessing the proposal, the Organization shall take into account the criteria which are to be included in each proposal for adoption as set forth in section 3 above.

4.3 An Emission Control Area shall be designated by means of an amendment to this Annex, considered, adopted and brought into force in accordance with article 16 of the present Convention.

5 OPERATION OF EMISSION CONTROL AREAS

5.1 Parties which have ships navigating in the area are encouraged to bring to the Organization any concerns regarding the operation of the area.

APPENDIX IV

TYPE APPROVAL AND OPERATING LIMITS FOR SHIPBOARD INCINERATORS (Regulation 16)

(1) Ships incinerators described in regulation 16(6) on board shall possess an IMO type approval certificate for each incinerator. In order to obtain such certificate, the incinerator shall be designed and built to an approved standard as described in regulation 16(6). Each model shall be subject to a specified type approval test operation at the factory or an approved test facility, and under the responsibility of the Administration, using the following standard fuel/waste specification for the type approval test for determining whether the incinerator operates within the limits specified in paragraph (2) of this appendix:

Sludge Oil Consisting of:	75% Sludge oil from HFO; 5% waste lubricating oil; and 20% emulsified water.
Solid waste consisting of:	50% food waste; 50% rubbish containing; approx. 30% paper, " 40% cardboard, " 10% rags, " 20% plastic The mixture will have up to 50% moisture and 7% incombustible solids.

(2) Incinerators described in regulation 16(6) shall operate within the following limits:

O2 in combustion chamber:	6 – 12%
CO in flue gas maximum average:	200 mg/MJ
Soot number maximum average:	Bacharach 3 or Ringelman 1 (20% opacity) (A higher soot number is acceptable only during very short periods such as starting up)
Unburned components in ash residues:	Maximum 10% by Weight
Combustion chamber flue gas outlet temperature range:	850 – 1200 degrees Celsius

APPENDIX V

Appendix V will be reviewed and updated, based on the final decision.

DRAFT NEW APPENDIX VI

Fuel Verification Procedure for MARPOL Annex VI Fuel Samples

The following procedure shall be used to determine whether the fuel oil delivered to and used on board ships is compliant with the standards required by MARPOL Annex VI.

1 General Requirements

1.1 The representative fuel oil sample, which is required by paragraph 6(a) of regulation 18 (the "MARPOL sample") shall be used to verify the sulphur content of the fuel oil supplied to a ship.

1.2 An Administration, through its Port State Control Officers, shall manage the verification procedure.

1.3 The laboratories responsible for the verification procedure set forth in this appendix shall be fully accredited[19] for the purpose of conducting the test method(s).

2 Verification Procedure Stage 1

2.1 The MARPOL sample should be delivered by the port State control officers to the laboratory.

2.2 The laboratory shall:

.1 record the details of the seal number and the sample label on the test record;

.2 confirm that the condition of the seal on the MARPOL sample has not been broken; and

.3 reject any MARPOL sample where the seal has been broken.

2.3 If the seal of the MARPOL sample has not been broken, the laboratory shall proceed with the verification procedure and shall:

.1 ensure that the MARPOL sample is thoroughly homogenized;

.2 draw two sub-samples from the MARPOL sample; and

.3 reseal the MARPOL sample and record the new reseal details on the test record.

2.4 The two sub samples should be tested in succession, in accordance with the specified test method referred to in Appendix V. For the purposes of this verification procedure, the results of the test analysis shall be referred to as "A" and "B".

.1 If the results of "A" and "B" are within the repeatability (r) of the test method, the results shall be considered valid; and

[19] Accreditation is in accordance with ISO 17025 or an equivalent standard.

.2 If the results of "A" and "B" are not within the repeatability (r) of the test method, both results shall be rejected and two new sub-samples should be taken by the laboratory and analysed. The sample bottle should be resealed in accordance with paragraph 2.3.3 above after the new sub-samples have been taken.

2.5 If the test results of "A" and "B" are valid, an average of these two results should be calculated thus giving the result referred to as "X".

.1 If the result of "X" is equal to or falls below the standards required by Annex VI, the fuel oil shall be deemed to meet the requirements; and

.2 If the result of "X" is greater than the standards required by Annex VI, Verification Procedure Stage 2 should be conducted; however, if the result of "X" is greater than the specification limit by 0.59R (where R is the reproducibility of the test method), the fuel oil shall be considered non-compliant and no further testing is necessarily.

3 Verification Procedure Stage 2

3.1 If Stage 2 of the verification procedure is necessarily in accordance with paragraph 2.5.2 above, the port State control officers shall send the MARPOL sample to a second accredited laboratory.

3.2 Upon receiving the MARPOL sample, the laboratory shall:

.1 record the details of the seal number and the sample label on the test record;

.2 draw two sub-samples from the MARPOL sample; and

.3 reseal the MARPOL sample and record the new reseal details on the test record.

3.3 The two sub-samples should be tested in succession, in accordance with the test method specified in Appendix V. For the purposes of this verification procedure, the results of the test analysis shall be referred to as "C" and "D".

.1 if the results of "C" and "D" are within the repeatability (r) of the test method, the results shall be considered valid; and

.2 if the results of "C" and "D" are not within the repeatability (r) of the test method, both results shall be rejected and two new sub-samples shall be taken by the laboratory and analysed. The sample bottle should be resealed in accordance with paragraph 3.1.3 after the new sub-samples have been taken.

3.4 If the test results of "C" and "D" are valid, and the results of "A", "B", "C", and "D" are within the reproducibility (R) of the test method then the laboratory shall average the results, which is referred to as "Y".

.1 if the result of "Y" is equal to or falls below the standards required by Annex VI, the fuel oil shall be deemed to meet the requirements;

.2 if the result of "Y" is greater than the standards required by Annex VI, then the fuel oil fails to meet the standards required by Annex VI; and

.3 if the result of "A", "B", "C", and "D" are not within the reproducibility (R) of the test method then the Administration may discard all of the test results and, in its discretion, repeat the entire testing process.

3.5 The results obtained from the verification procedure are final.

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ANNEX 2

DRAFT AMENDED NOx TECHNICAL CODE

[Text of annex 2 may be found in document MEPC 57/4/23/Add.1]

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ANNEX 3

PROPOSED AMENDMENTS TO
DRAFT REVISED GUIDELINES FOR EXHAUST GAS CLEANING SYSTEMS – MARPOL ANNEX VI, REGULATION 14(4) AS AGREED BY BLG 12

10 WASHWATER

10.1 Washwater criteria

10.1.1 When the EGC System is operated in ~~a~~ ports, harbours, or estuaries, the discharge water should comply with the following limits:

10.1.2 **pH criteria**

10.1.2.1 ~~The washwater shall have a pH of not less than 6,5 at the overboard discharge with the exception that during manoeuvring and transit, the maximum difference between inlet and outlet of 2 pH units is allowed.~~ The washwater pH should comply with one of the following requirements which should be recorded in the ETM:

(i) The discharge washwater should have a pH of no less than 6.5 at the overboard discharge with the exception that during manoeuvring and transit, the maximum difference between inlet and outlet of 2 pH units is allowed.

(ii) During commissioning of the unit(s) after installation, the discharged washwater plume should be measured externally from the ship (at rest in harbour) and the discharge pH at the ship's overboard pH monitoring point will be recorded when the plume at 4 metres from the discharge point equals or is above pH 6.5. The discharged pH to achieve a minimum pH units of 6.5 will become the overboard pH discharge limit recorded in the ETM.

10.1.3 **PAHs (Polycyclic Aromatic Hydrocarbons)**

The washwater PAH should comply with the following requirements. The appropriate limit should be recorded in the ETM.

10.1.3.1 ~~The maximum continuous PAH concentration in the washwater should not be greater than [15 ppb PAH_{16} equivalents] above the inlet water PAH concentration. PAH_{16} are defined by USEPA (Method 610). For the purposes of this criteria, the PAH concentration in the washwater should be measured downstream of the water treatment equipment, but upstream of washwater dilution or other reactant dosing, if used, prior to discharge.~~ The maximum continuous PAH concentration in the washwater should not be greater than 50 µg/L PAH_{phe} (phenanthrene equivalence) above the inlet water PAH concentration. For the purposes of this criteria, the PAH concentration in the washwater should be measured downstream of the water treatment equipment, but upstream of any washwater dilution or other reactant dosing unit, if used, prior to discharge.

10.1.3.2 ~~[The 15 ppb limit described above is normalized for a washwater flow rate through the EGC unit of 45 t/MWh where the MW refers to the nominal power of the combustion unit. This limit would have to be adjusted upward for lower washwater flow rates or for higher power, and vice versa, according to the table below. In no circumstances is the concentration to exceed 500 ppb PAH_{16} equivalents.~~ The 50 µg/L limit described above is normalized for a

washwater flow rate through the EGC unit of 45t/MWh where the MW refers to the MCR or 80% of the power rating of the fuel oil combustion unit. This limit would have to be adjusted upward for lower washwater flow rates per MWh, and vice-versa, according to the table below.

~~[~~

~~Flow Rate (t/MWh)~~	~~Discharge Concentration Limit (ppb PAH_{16} equivalents)~~	~~Measurement Technology~~
~~0 – 1.35*~~	~~500~~	~~Ultraviolet Light~~
~~5~~	~~135~~	~~Fluorescence~~
~~11.25~~	~~60~~	~~- " -~~
~~22.5~~	~~30~~	~~- " -~~
~~45~~	~~15~~	~~- " -~~
~~90~~	~~7.5~~	~~- " -~~

~~* this flow rate was calculated based on the maximum oil discharge concentration of 15 ppm by applying a factor of 30 to PAH_{16} equivalent concentration.]~~

Flow Rate (t/MWh)	Discharge Concentration Limit (µg/L PAH_{phe} equivalents)	Measurement Technology
0 – 1	2250	Ultraviolet Light
2.5	900	- " -
5	450	Fluorescence
11.25	200	- " -
22.5	100	- " -
45	50	- " -
90	25	- " -

10.1.3.3 For a 15-minute period in any 12-hour period, the continuous PAH_{phe} concentration limit may exceed the limit described above ~~up to 500 ppb PAH_{16} equivalents. This would allow for an abnormal start up of the EGC unit.~~ by up to 100%. This would allow for an abnormal start up of the EGC unit.

10.1.4 **Turbidity/Suspended Particle Matter**

The washwater turbidity should comply with the following requirements. The limit should be recorded in the ETM.

10.1.4.1 The washwater treatment system should be designed to minimize suspended particulate matter, including heavy metals and ash.

10.1.4.2 The maximum continuous turbidity in washwater should not be greater than 25 FNU (formazin nephlometric units) or 25 NTU (nephlometric turbidity units) or equivalent units, above the inlet water turbidity. However during periods of high inlet turbidity the precision of the measurement device and the time lapse between inlet measurement and outlet measurement are such that the use of a difference limit is unreliable. Therefore all turbidity difference readings should be a rolling average over a 15-minute period to a maximum of 25 FNU. For the purposes of this criteria the turbidity in the washwater should be measured downstream of the water treatment equipment but upstream of washwater dilution (or other reactant dosing) prior to discharge.

10.1.4.3 For a 15-minute period in any 12-hour period, the continuous turbidity discharge limit may be exceeded by 20%.

10.1.5 **Nitrates**

10.1.5.1 The washwater treatment system should prevent the discharge of nitrates beyond that associated with a ~~[10%]~~ 12% removal of NO_x from the exhaust, or beyond ~~[1]~~ 60 mg/l normalized for washwater discharge rate of 45 tons/MWh whichever is greater.

10.1.5.2 All systems should be tested for nitrates in the discharge water. If typical nitrate amounts are above 80% of the upper limit, it should be recorded in the ETM.

10.1.6 **Washwater additives and other substances**

10.1.6.1 ~~EGC technologies could employ chemical processes, active substances, preparations or create relevant chemicals *in situ*. The impact of these materials and/or processes on the washwater discharge, if unknown, should be assessed. [Taking into account the work of GESAMP and relevant guidelines such as resolution MEPC 126(53) Procedure for approval of ballast water management systems that make use of active substances (G9). GESAMP procedures should be applied to future washwater discharge assessment and if necessary the establishment of additional washwater discharge criteria.]~~
An assessment of the washwater is required for those EGC technologies which make use of active substances, preparations or create relevant chemicals *in situ*. The assessment could take into account relevant guidelines such as resolution MEPC 126(53), procedure for approval of ballast water management systems that make use of active substances (G9) and if necessary additional washwater discharge criteria should be established.

10.2 Washwater monitoring

10.2.1 pH, oil content (as measured by PAH levels), and turbidity should be continuously monitored and recorded as recommended in section 1 of these guidelines. The monitoring equipment should also meet the performance criteria described below:

pH

10.2.2 The pH electrode and pH meter should have a resolution of 0.1 pH units and temperature compensation. The electrode should comply with the requirements defined in BS 2586 or of equivalent or better performance and the meter should meet or exceed BS EN ISO 60746-2:2003.

PAH

10.2.3 ~~[~~The PAH monitoring equipment should be capable to monitor PAH in water in a range ~~of 1 ppb .to 500 ppb using fluorescence light monitoring or equivalent~~ to at least twice the discharge concentration limit given in the table above. The equipment should be demonstrated to operate correctly and not deviate more than 5% in washwater with turbidity within the working range of the application.~~]~~

10.2.4 ~~[~~For those applications discharging at lower flow rates and higher PAH concentrations, ultraviolet light monitoring technology or equivalent, should be used due to its reliable operating range.~~]~~

Turbidity

10.2.5 The turbidity monitoring equipment should meet requirements defined in ISO 7027:1999 or USEPA 180.1.

10.3 Washwater monitoring data recording

10.3.1 The data recording system should comply with the requirements of sections 7 and 8 and should continuously record pH, PAH and Turbidity as specified in the washwater criteria.

10.4 Washwater residue

10.4.1 Residues generated by the EGC unit should be delivered ashore to ~~authorized~~ adequate reception facilities. Such residues should not be discharged to the sea or incinerated on board.

10.4.2 ~~The storage and disposal of washwater residues are to be documented in accordance with MARPOL Annex I Appendix III: Form of Oil Record Book Part 1 Machinery spaces, Code C: Collection and disposal of oil residues (sludge and other residues) and MARPOL Annex I, regulation 17.2.3.~~
Each ship fitted with an EGC unit should record the storage and disposal of washwater residues in an EGC log, including the date, time and location of such storage and disposal. The EGC may form a part of any existing log book or electronic recording system as approved by the Administration.

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ANNEX 4

DRAFT GUIDELINES FOR THE DEVELOPMENT OF A VOC MANAGEMENT PLAN

1 Objectives

.1 The purpose of the VOC Management Plan is to ensure that the operation of a tanker, to which regulation 15 of Annex VI applies, prevents or minimizes VOC emissions to the extent possible.

.2 Emissions of VOCs can be prevented or minimized by:

– optimizing operational procedures to minimize the release of VOC emissions; and/or

– using devices, equipment, or design changes to prevent or minimize VOC emissions.

.3 To comply with this plan, the loading, carriage and discharge of cargoes which generate VOC emissions should be evaluated and procedures written to ensure that the operations of a ship follow best management practices for preventing or minimizing VOC emissions to the extent possible. If devices, equipment, or design changes are implemented to prevent or minimize VOC emissions, they shall also be incorporated and described in the VOC management plan as appropriate.

.4 While maintaining the safety of the ship, the VOC Management Plan should encourage and, as appropriate, set forth the following best management practices:

– the loading procedures should take into account potential gas releases due to low pressure and, where possible, the routing of oil from crude oil manifolds into the tanks should be done so as to avoid or minimize excessive throttling and high flow velocity in pipes;

– partial filling of tanks should be avoided to the extent possible since the existence of a large volume of gas above the oil in the tanks will contribute to increased VOCs in the gas that is vented and also to the VOCs remaining in the tanks after discharge. The VOCs remaining in the tanks after the discharge of cargo will be emitted due to displacement during the next loading;

– tank filling and discharge sequencing should be planned to minimize the time needed to fill or discharge each tank;

– the ship should define a target operating pressure for the cargo tanks. This pressure should be as high as safely possible and the ship should aim to maintain tanks at this level during the loading and carriage of relevant cargo;

– when venting to reduce tank pressure is required, the decrease in the pressure in the tanks should be as small as possible to maintain the tank pressure as high as possible;

– the amount of inert gas added should be minimized. Increasing tank pressure by adding inert gas does not prevent VOC release but it may increase venting and therefore increased VOC emissions; and

– when crude oil washing is considered, its effect on VOC emissions should be taken into account. VOC emissions can be reduced by shortening the duration of the washing or by using a closed cycle crude oil washing unit.

2 Additional considerations

.1 Person in charge of carrying out the plan

– A person shall be designated in the VOC Management Plan to be responsible for implementing the plan and that person may assign appropriate personnel to carry out the relevant tasks;

.2 Procedures for Preventing or Minimizing VOC emissions

– Ship-specific procedures should be written or modified to address relevant VOC emissions, including the following operations:

- loading;

- carriage of relevant cargo;

- discharge; and

- crude oil washing.

– If the ship is equipped with VOC reduction devices or equipment, the use of these devices or equipment should be incorporated into the above procedures as appropriate.

.3 Training

– The plan should describe the training programmes to facilitate best management practices for the ship to prevent or minimize VOC emissions.

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