

SUB-COMMITTEE ON BULK LIQUIDS
AND GASES
15th session
Agenda item 19

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**REPORT TO THE MARITIME SAFETY COMMITTEE
AND THE MARINE ENVIRONMENT PROTECTION COMMITTEE**

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1 GENERAL

1.1 The Sub-Committee on Bulk Liquids and Gases (BLG) held its fifteenth session from 7 to 11 February 2011 under the chairmanship of Mr. S. Oftedal (Norway). The Vice-Chairman, Mr. R. Zhang (China), was also present.

1.2 The session was attended by delegations from the following Member Governments:

ALGERIA	LATVIA
ARGENTINA	LIBERIA
AUSTRALIA	LIBYAN ARAB JAMAHIRIYA
BAHAMAS	MALAYSIA
BANGLADESH	MALTA
BELGIUM	MARSHALL ISLANDS
BRAZIL	MEXICO
CANADA	MOROCCO
CHILE	NETHERLANDS
CHINA	NEW ZEALAND
COLUMBIA	NIGERIA
COOK ISLANDS	NORWAY
CUBA	PANAMA
CYPRUS	PERU
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA	PHILIPPINES
DENMARK	POLAND
DOMINICAN REPUBLIC	REPUBLIC OF KOREA
ECUADOR	ROMANIA
ESTONIA	RUSSIAN FEDERATION
FINLAND	SAUDI ARABIA
FRANCE	SINGAPORE
GERMANY	SOUTH AFRICA
GHANA	SPAIN
GREECE	SWEDEN
INDONESIA	TRINIDAD AND TOBAGO
IRAN (ISLAMIC REPUBLIC OF)	TURKEY
IRAQ	TUVALU
IRELAND	UKRAINE
ITALY	UNITED KINGDOM
JAPAN	UNITED STATES
KIRIBATI	VANUATU

and the following Associate Member of IMO:

HONG KONG, CHINA

1.3 The session was also attended by a representative from the following United Nations specialized agency:

INTERNATIONAL TELECOMMUNICATION UNION (ITU)

and observers from the following intergovernmental organizations:

EUROPEAN COMMISSION (EC)
MARITIME ORGANIZATION FOR WEST AND CENTRAL AFRICA (MOWCA)
INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA (ICES)

and by observers from the following non-governmental organizations in consultative status:

INTERNATIONAL CHAMBER OF SHIPPING (ICS)
INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)
INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC)
INTERNATIONAL UNION OF MARINE INSURANCE (IUMI)
BIMCO
INTERNATIONAL ASSOCIATION OF CLASSIFICATION SOCIETIES (IACS)
EUROPEAN CHEMICAL INDUSTRY COUNCIL (CEFIC)
OIL COMPANIES INTERNATIONAL MARINE FORUM (OCIMF)
INTERNATIONAL COUNCIL OF MARINE INDUSTRY ASSOCIATIONS (ICOMIA)
INTERNATIONAL FEDERATION OF SHIPMASTERS' ASSOCIATIONS (IFSMA)
COMMUNITY OF EUROPEAN SHIPYARDS' ASSOCIATIONS (CESA)
INTERNATIONAL ASSOCIATION OF INDEPENDENT TANKER OWNERS
(INTERTANKO)
INTERNATIONAL UNION FOR CONSERVATION OF NATURE (IUCN)
SOCIETY OF INTERNATIONAL GAS TANKER AND TERMINAL OPERATORS
LIMITED (SIGTTO)
DANGEROUS GOODS ADVISORY COUNCIL (DGAC)
CRUISE LINES INTERNATIONAL ASSOCIATION (CLIA)
INTERNATIONAL ASSOCIATION OF DRY CARGO SHIPOWNERS
(INTERCARGO)
INTERNATIONAL MARITIME LECTURERS ASSOCIATION (IMLA)
EUROPEAN ASSOCIATION OF INTERNAL COMBUSTION ENGINE
MANUFACTURERS (EUROMOT)
INTERNATIONAL PETROLEUM INDUSTRY ENVIRONMENTAL CONSERVATION
ASSOCIATION (IPIECA)
INSTITUTE OF MARINE ENGINEERING, SCIENCE AND TECHNOLOGY
(IMarEST)
INTERNATIONAL SHIP MANAGERS' ASSOCIATION (InterManager)
INTERNATIONAL PARCEL TANKERS ASSOCIATION (IPTA)
INTERNATIONAL SAILING FEDERATION (ISAF)
THE INTERNATIONAL MARINE CONTRACTORS ASSOCIATION (IMCA)
INTERNATIONAL BUNKER INDUSTRY ASSOCIATION (IBIA)
INTERNATIONAL TRANSPORT WORKERS' FEDERATION (ITF)
INTERNATIONAL PAINT AND PRINTING INK COUNCIL (IPPIC)
INTERNATIONAL SPILL CONTROL ORGANIZATION (ISCO)
NACE INTERNATIONAL
THE NAUTICAL INSTITUTE (NI)
CLEAN SHIPPING COALITION (CSC)

Opening address of the Secretary-General

1.4 The Secretary-General welcomed participants and delivered his opening address, the full text of which is reproduced in document BLG 15/INF.9.

Chairman's remarks

1.5 The Chairman, in thanking the Secretary-General, stated that his words of encouragement as well as his advice and requests would be given every consideration and that his helpful guidance on the subjects to be considered by the Sub-Committee was very much appreciated, in particular concerning the further work on the uniform implementation of the 2004 BWM Convention; the development of measures related to the transfer of aquatic species through biofouling of ships; the application of the requirements for the carriage of bio-fuels; and matters related to entry into enclosed spaces aboard ships.

Adoption of the agenda

1.6 The Sub-Committee adopted the agenda (BLG 15/1 and Corr.1) and agreed, in general, to be guided in its work by the annotations contained in document BLG 15/1/1, also taking into account document BLG 15/1/2 concerning the arrangements for the session. The agenda, as adopted, together with the list of documents considered under each agenda item, is set out in document BLG 15/INF.10.

2 DECISIONS OF OTHER IMO BODIES

General

2.1 The Sub-Committee noted the outcomes of DE 53, MEPC 60, FP 54, MSC 87, C 104, FSI 18, DSC 15, DE 54, MEPC 61 and MSC 88 relevant to the work of the Sub-Committee, as reported in documents BLG 15/2, BLG 15/2/1 and BLG 15/2/2 and took them into account in its deliberations when dealing with relevant agenda items.

Decisions by C 104

2.2 With regard to the outcome of C 104, the Sub-Committee noted that the Council had approved a number of cost-saving measures with a view to improving the conduct of meetings by increasing efficiency and effectiveness. In this context, the measures of immediate interest to the work of the Sub-Committee are highlighted as follows:

- .1 other than information documents and reports from the Committees and sub-committees, including the reports of working, drafting and correspondence groups established by them, documents which contain more than 20 pages should not be translated in their entirety. They should include, for translation purposes, a summary of the document not longer than four pages, with the remaining content submitted as an annex in the language that may be needed, for example, by working groups (e.g., English);
- .2 only two copies of working papers printed for circulation during a meeting will be printed per Member State, Associate Member and IGO and one copy per NGO;
- .3 working papers will be uploaded on to IMODOCS simultaneously with being printed and distributed in hard copy;
- .4 the Chairmen of IMO organs and the Secretariat should examine how best to reduce the size of meeting reports and standardize their style and structure; and

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- .5 to save meeting time, information documents, and documents requiring no action other than for their contents to be noted, should not be introduced in the plenary meetings of any IMO organ.

3 EVALUATION OF SAFETY AND POLLUTION HAZARDS OF CHEMICALS AND PREPARATION OF CONSEQUENTIAL AMENDMENTS

3.1 The Sub-Committee recalled that this part of the agenda traditionally contains routine classification tasks which are normally put directly to the ESPH Working Group prior to further consideration by the Sub-Committee. Notwithstanding the above, the Sub-Committee also recalled that it traditionally considers the report of the intersessional meeting of the ESPH Working Group and any other documents submitted to the session containing matters of principle for which discussions in plenary are necessary.

Report of the ESPH 16

3.2 In considering the report of the sixteenth intersessional meeting of the ESPH Working Group (BLG 15/3), the Sub-Committee approved the report in general and, in particular:

- .1 agreed with the evaluation of new products and consequential inclusion in the IBC Code;
- .2 concurred with the evaluation of cleaning additives, noting that 114 formulations had been evaluated, 62 of which were approved for inclusion in the list of cleaning additives meeting the requirements of the criteria outlined in MEPC.1/Circ.590;
- .3 noted the concern with regard to the use of cleaning additives components that are carcinogenic, mutagenic and reprotoxic;
- .4 agreed with the re-evaluation of Alkanes (C10-C26), linear and branched and to its consequential inclusion in the IBC Code;
- .5 endorsed the method of work utilized for reviewing trade-named mixtures where there are concerns due to the confidentiality of mixture formulations;
- .6 agreed to the evaluation of the trade-named mixtures presenting safety hazards and their consequential inclusion in List 3 of the MEPC.2/Circular with validity for all countries and no expiry date;
- .7 agreed to the preparation of draft amendments to chapters 17, 18 and 19 of the IBC Code for approval and adoption by MEPC and MSC for substances in List 1 of the MEPC.2/Circular, which are "valid for all countries" with "no expiry date" noting that, in order to consolidate all new information, this should also include the recent electrical equipment data assembled for existing products in the IBC Code (see also paragraphs 3.4 and 3.15.5);
- .8 noted the discussions in relation to undertaking a review of chapters 17 and 18 of the IBC Code and the proposals made for progressing this issue in a staged manner;

- .9 noted the progress made on producing a consolidated summary of decisions taken by the ESPH Working Group as endorsed by the BLG Sub-Committee;
- .10 noted the good progress achieved in response to the initiative to collate missing information on electrical equipment criteria as requested in MSC.1/Circ.1325 and recognized the need for the new information for column i to be included in the next set of amendments to be made to the IBC Code and for this data to be available for 1 January 2013; and
- .11 approved the future work programme of the ESPH Working Group, notwithstanding any additional tasks that may be given to the group following discussion of items relevant to their work.

3.3 In regard to paragraph 3.2.2 above on cleaning additives, it was noted by the delegation of the Cook Islands that handling such large numbers of cleaning additives was a sizeable task and it questioned if any charges were being made for this activity. The Sub-Committee was advised that the high level of evaluations requested was probably a consequence of the fact that the old standard for the evaluation of cleaning additives, as specified in MEPC/Circ.363, had now ceased to be valid from 1 August 2010 and that products now needed to be assessed following the new guidelines contained in MEPC.1/Circ.590. An initial high demand for the evaluation of cleaning additives following the transition period was therefore perhaps not unexpected, although this should level out after a period of time. With respect to charges, it was noted that no fees are levied for the evaluation of cleaning additives, but if any components of a product need to have a GESAMP Hazard profile assigned, then this is charged in line with the procedures established previously as noted in BLG.1/Circ.28.

3.4 With reference to paragraph 3.2.7 above, on the issue of planning for the next set of amendments to the IBC Code, as noted in paragraph 4.30 of document BLG 15/3, the delegation of France advised that the timescale mentioned was perhaps too optimistic and it was proposed therefore that the ESPH Working Group should be requested to develop a realistic timetable for this activity for consideration by the Sub-Committee.

3.5 With regard to paragraph 3.2.8 above on the approach being taken to review the nature of the inconsistencies in carriage requirements noted for a number of entries in chapter 17 of the IBC Code, it was emphasized by the delegation of the Cook Islands that any amendments should not be undertaken in a piecemeal fashion as with constant changes, this has the potential to create a significant degree of confusion for users of the IBC Code. If revisions are required, and this may be the case, it would be preferable therefore to address matters in totality.

Proposals for the addition of new Trade-named mixture products to List 3 of the MEPC.2/Circular

3.6 The Sub-Committee noted documents BLG 15/3/1, BLG 15/3/2, BLG 15/3/3 and BLG 15/3/4 (Belgium), relating to a range of Solvesso materials, and BLG 15/3/8 (South Africa), for the product VALUE CA, proposing that these mixtures to be incorporated into List 3 of the MEPC.2 circular as permanent entries.

3.7 The Sub-Committee tasked the ESPH Working Group to carry out the evaluation of the above proposals since it was recognized that the evaluation of such products is a routine task of the working group, which is normally put directly to the group prior to any further consideration by the Sub-Committee.

Associated issues

3.8 Having considered the following documents:

- .1 BLG 15/3/6 (Secretariat), summarizing the decisions taken in relation to the GESAMP Hazard profiles and the classification of products;
- .2 BLG 15/3/7 (CEFIC), providing updated information on the exercise to collate electrical equipment data for column "i" of the IBC Code; and
- .3 BLG 15/3/9 (Chairman of the ESPH Working Group), addressing inconsistencies in the carriage requirements in chapters 17 and 18 of the IBC Code,

the Sub-Committee agreed to forward them to the ESPH Working Group for consideration and action, as appropriate.

3.9 The Sub-Committee also considered the following related documents, which were submitted under agenda items 10 (Revision of the IGC Code) and 18 (Any Other Business):

- .1 BLG 15/10/3 (United Kingdom), providing details of a new product for inclusion in chapter 19 of the IGC Code; and
- .2 BLG 15/18 (Italy), concerning classification matters related to the transportation of formic acid,

and decided to refer them to the ESPH Working Group for further consideration and action, as appropriate.

Re-issuing of certificates

3.10 With respect to document BLG 15/3/5 (Norway), which expressed concern regarding the re-issuing of Chemical Carrier Code Certificates of Fitness following the introduction of any amendments to chapters 17 and 18 of the IBC Code, there was a general agreement within the Sub-Committee that there was a need for further guidance on the issues raised.

3.11 It was proposed that the ESPH Working Group should investigate the details of the proposal and that this item should therefore be added to the terms of reference to be established for the group.

3.12 It was noted that the proposal presented in paragraph 23.5 of document BLG 15/3/5, relating to how to refer to future IBC Code amendments, would need consideration from the perspective of all Codes governed by the standard procedures adopted by the Organization. In this context, the ESPH Working Group was requested to identify and separate any general points from those which were more specific to the IBC Code and then advise the Sub-Committee accordingly.

3.13 The Sub-Committee was advised by the group's Chairman that the Guidance on the timing of replacement of existing certificates by the certificates issued after the entry into force of amendments to certificates in IMO instruments (MSC-MEPC.5/Circ.6) might partially address some of the issues to be discussed and that this should be taken into account when reviewing the proposals set out in document BLG 15/3/5. It was also suggested that, depending upon what conclusions are reached, an update to the above circular might need to be considered to incorporate any new principles which may be adopted.

Establishment of the ESPH Working Group

3.14 Recognizing the necessity to make further progress on the above issues, the Sub-Committee established the Working Group on Evaluation of Safety and Pollution Hazards of Chemicals (ESPH) and instructed it, taking into account the comments and decisions made in plenary, to:

- .1 consider issues relating to the evaluation of new products;
- .2 conduct an evaluation of cleaning additives;
- .3 review MEPC.2/Circular on Provisional classification of liquid substances transported in bulk, and other related matters;
- .4 give further consideration to the application of requirements for the carriage of bio-fuels and bio-fuel blends;
- .5 review the timeline and scope of the next amendments to the IBC Code;
- .6 consider options for addressing the inconsistencies in carriage requirements noted for a number of entries in chapters 17 and 18 of the IBC Code;
- .7 advise on the inclusion of a new product, Mixed C4, for chapter 19 of the IGC Code;
- .8 review classification issues related to the shipment of formic acid;
- .9 advise on the issues raised by the FP Sub-Committee in relation to the proposed draft SOLAS amendments dealing with inert gas systems;
- .10 consider the development of further IMO guidance on the re-issuing of Chemical Code certificates, identifying generic and specific issues; and
- .11 prepare the work programme and agenda for ESPH 17.

Report of the ESPH Working Group

3.15 Having considered the report of the ESPH Working Group (BLG 15/WP.3), the Sub-Committee approved it in general and, in particular:

- .1 approved the issuance of BLG.1/Circ.31 on Decisions on the categorization and classification of products, as set out in annex 1 of document BLG 15/WP.3, subject to the endorsement of MSC 89 and MEPC 62;
- .2 concurred with the evaluation of cargo tank cleaning additives found to meet the requirements of regulation 13.5.2 of MARPOL Annex II, as set out in annex 1, for inclusion in the next edition of the MEPC.2/Circular, subject to the endorsement by MEPC 62;
- .3 noted the concern regarding the use of cleaning additive components that are carcinogenic, mutagenic, reprotoxic or sensitizing;

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- .4 agreed to the evaluation of the Trade-named mixtures presenting safety hazards, as set out in annex 3 of document BLG 15/WP.3, for inclusion in List 3 of the MEPC.2/Circular, with validity for all countries and no expiry date;
 - .5 agreed to the timeline for the preparation of the draft amendments to chapters 17, 18 and 19 of the IBC Code, with a view to adoption by MEPC 64 and MSC 91, as set out in annex 8 of document BLG 15/WP.3, subject to endorsement of MSC 89 and MEPC 62 (see paragraph 16.11);
 - .6 agreed that products with new complete data for column 'i' (electrical equipment) be added to List 1 of the MEPC.2/Circular;
 - .7 noted the discussions on the review of inconsistencies in chapters 17 and 18 of the IBC Code and that this issue would be further considered by the ESPH Working Group;
 - .8 approved the issuance of BLG.1/Circ.32 on Carriage conditions and special requirements assigned for Mixed C4, for inclusion as a new entry into the IGC Code, as set out in annexes 9 and 10 of document BLG 15/WP.3, subject to the endorsement of MSC 89 and MEPC 62;
 - .9 agreed to the revision of the carriage requirements of Formic acid, for inclusion in List 1 of the MEPC.2/Circular;
 - .10 noted the discussion on the points raised at FP 54 and requested the Secretariat to forward the outcome of the group's discussions to FP 55 for further consideration;
 - .11 noted the group's view that the re-issue of Chemical Carrier Code Certificates of Fitness needs to be continued and agreed that this matter should be incorporated into the work programme for ESPH 17;
 - .12 approved the future work programme for the intersessional meeting of the ESPH Working Group in October 2011, as set out in annex 12 of document BLG 15/WP.3; and
 - .13 agreed to request MSC 89 and MEPC 62 to approve an intersessional meeting of the ESPH Working Group in 2012.

3.16 With respect to paragraph 3.15.2 on the evaluation of cleaning additives, it was emphasized by the delegation of the Cook Islands that, once again, this had been a significant task to undertake and, notwithstanding that this was performed as a sub-group activity, it may nevertheless be diverting time away from other agenda items which were being held over for further consideration until the next meeting of the group. The delegation of the Cook Islands suggested that there may be a better way of conducting this evaluation work and that this should be explored further. The Sub-Committee noted above view and invited delegations with similar concerns to submit proposals for amendments to the established procedures.

3.17 In regard to paragraph 3.15.10, with respect to the issues raised by FP 54 on inert gas systems for chemical tankers, as highlighted in paragraph 11.2.3 of document BLG 15/WP.3, the Sub-Committee agreed with the proposal of the delegation of the Cook

Islands, for the purpose of clarity, to replace the first sentence of paragraph 11.2.3 of document BLG 15/WP.3 with the following new text:

"it would be inappropriate to amend column 'h' tank environmental controls to incorporate proposed amendments to SOLAS inert gas requirements for new chemical tankers since chapter 17 of the IBC Code applies to all ships carrying chemicals in bulk regardless of their size or date of construction.",

and requested the Secretariat to take action accordingly when reporting the outcome on this matter to FP 55.

4 APPLICATION OF THE REQUIREMENTS FOR THE CARRIAGE OF BIO-FUELS AND BIO-FUEL BLENDS

General

4.1 The Sub-Committee recalled that bio-fuels are being shipped in increasing quantities worldwide and that these products are often carried blended with mineral fuel. In such cases, there has been a question as to whether the blended product should be carried under MARPOL Annex I or Annex II.

4.2 It was also recalled that previously a number of conclusions had been reached with respect to the development of new guidelines for the shipment of bio-fuel/petroleum oil blends and for blending on board.

Report of ESPH 16

4.3 In considering the part of the report of ESPH 16 related to this item (BLG 15/3, sections 6 and 7), the Sub-Committee noted that ESPH 16 had prepared draft Guidelines for the carriage and blending of bio-fuel/petroleum oil mixtures, as set out in annex 6 to document BLG 15/3. It was agreed that further development of the draft text was still necessary before it could be finalized for consideration by the Sub-Committee, taking into account the possibility of adding new materials to the bio-fuels currently recognized within the draft Guidelines.

4.4 In this regard, the Sub-Committee noted the concern raised by the delegation of the Netherlands with respect to paragraph 4.1.3 of the draft Guidelines which, in their view, effectively presented an open-ended option to ship bio-fuel/petroleum oil blends when the ODME is not approved for the mixture being transported. They proposed that a time limit should be set for this waiver in order that such shipments may be brought back into line with the normal Annex I requirements following a reasonable period to resolve any ODME functionality issues.

4.5 The Sub-Committee endorsed the above view and agreed that the ESPH Working Group should develop appropriate text setting a suitable timeline for incorporation into the Guidelines.

4.6 Taking account of the necessary timeline for the MEPC to approve the Guidelines to be disseminated as an MEPC circular, the Sub-Committee noted that a short extension to the deadline set of 1 July 2011 for the existing interim guidance would be required in order to maintain continuity from the current conditions to the new standards. Consequently, it was agreed that the current interim guidance should remain in effect until 1 September 2011 if the MEPC circular is to be proposed for approval at MEPC 62.

4.7 Once the new Guidelines are approved, the Sub-Committee agreed that the addition of the generic entries for the specified bio-fuel blends to List 1 of the MEPC.2/Circular (with subsequent incorporation into the IBC Code) was the process to follow and it was noted that this could take place for the 2011 issue of the MEPC.2/Circular with a reference to the generic entries also being made on the IMO website.

4.8 It was noted that the group had agreed to remove from the Guidelines the option to carry the recognized bio-fuel/petrochemical oil blends under a tripartite agreement and, therefore, it had been decided not to include the hazard profiles which had been developed for Gasoline and Diesel in List 5 of the MEPC.2/Circular. It was agreed that, to deal with any new bio-fuel substances which might be blended for MARPOL Annex II carriage in the future, the carriage conditions as specified in the Guidelines for the bio-fuels should be utilized as a reference if it is necessary to establish a tripartite agreement for such new materials and their petrochemical oil blends.

4.9 With regard to the need to incorporate guidance for blending operations carried out in a port, the Sub-Committee was advised that, after carefully reviewing a number of practical considerations which had been raised, the group had concluded that detailed operational procedures for blending operations "in port" should not be addressed within the proposed Guidelines as these need to be controlled and monitored by the port authorities concerned.

4.10 With respect to the prohibition of blending activity during the sea voyage, the Sub-Committee noted that a new draft had been developed addressing recent input in relation to the needs of the offshore support service industry. It was requested that this draft should now be finalized by the Working Group, addressing particularly the issue of how best to describe the cargoes involved. The delegation of France proposed that the regulation should apply to all bulk liquid cargoes and that it was not appropriate to refer to MARPOL cargoes within SOLAS.

Associated issues

4.11 The Sub-Committee considered document BLG 15/4 (Finland), proposing to extend the recognized bio-fuels as referenced in the proposed Guidelines for shipping bio-fuel/petroleum oil blends to incorporate renewable diesel products, and agreed that the ESPH Working Group should be tasked to address this issue and to propose any amendments into the draft Guidelines as may be necessary.

Instructions to the ESPH Working Group

4.12 Taking note of the above actions and comments, the Sub-Committee instructed the ESPH Working Group established under agenda item 3 (Evaluation of safety and pollution hazards of chemicals and preparation of consequential amendments) to continue its work on the development of carriage standards for bio-fuel blends (see also paragraph 3.14.4).

Report of the ESPH Working Group

4.13 Having considered the part of the report of the ESPH Working Group (BLG 15/WP.3), related to this agenda item, the Sub-Committee took action in relation to bio-fuels and bio-fuel blends as follows:

- .1 agreed to the inclusion of two new bio-fuels into the draft Guidelines for the carriage of blends of petroleum oil and bio-fuels;

- .2 agreed to the draft MEPC circular on Guidelines for the carriage of blends of petroleum oil and bio-fuels, as set out in annex 2, for approval by MEPC 62;
- .3 agreed to the inclusion of a new annex for recognized bio-fuels in the MEPC.2/Circular and the addition of generic carriage requirements for bio-fuel/petroleum oil blends into List 1;
- .4 agreed to new draft SOLAS regulation VI/5-2 to prohibit the blending of bulk liquid cargoes during the sea voyage, as set out in annex 3, for approval by MSC 89 with a view to subsequent adoption by MSC 90; and
- .5 deleted the item on Bio-fuels from the work programme of the ESPH Working Group as consideration of the matter had been completed.

4.14 With respect to paragraph 4.13.2, in particular, paragraphs 6.12 and 6.13 of document BLG 15/WP.3 regarding the timescale for introducing the new guidelines, the Sub-Committee agreed, in principle, with suggestion by the observer of IACS that when preparing the cover note for the proposed circular, it should be made clear as to when the transition from the interim guidance to the new guidelines will occur.

Completion of the work on this output

4.15 The Committees were invited to note that the work on this output had been completed.

5 DEVELOPMENT OF GUIDELINES AND OTHER DOCUMENTS FOR UNIFORM IMPLEMENTATION OF THE 2004 BWM CONVENTION

5.1 The Sub-Committee noted that, since BLG 14, five more States (Brazil, Canada, Croatia, Malaysia and the Netherlands) have acceded to the Ballast Water Management Convention, which brought the number of contracting Governments to 27 representing 25.32% of the world merchant fleet tonnage. The Sub-Committee urged the other Member States to ratify this Convention at the earliest possible opportunity.

5.2 The Sub-Committee also noted that MEPC 61 approved the Framework for determining when a Basic Approval granted to one ballast water management system may be applied to another system that uses the same Active Substance or Preparation and the Guidance for Administrations on the Type Approval process for ballast water management systems in accordance with Guidelines (G8), which were disseminated as BWM.2/Circ.27 and BWM.2/Circ.28, respectively.

5.3 The Sub-Committee noted further that, in view of the significant volume of work required for the timely and effective implementation of the BWM Convention, MEPC 61 had agreed to extend the target completion year for this output to 2012.

5.4 The Sub-Committee recalled that BLG 14 had agreed to re-establish the Ballast Water and Biofouling Working Group at this session to deal with agenda items 5 and 9, with the provisional terms of reference set out at annex 5 to document BLG 14/17.

Planning of the work

5.5 The Sub-Committee had for its consideration 14 documents submitted under this item and agreed to plan its work as follows:

- .1 consideration of documents on development of a BWM circular to provide ballast water sampling and analysis protocols, taking into account documents BLG 15/5/1, BLG 15/5/4, BLG 15/5/5 and BLG 15/5/6 (Austria *et al.*), BLG 15/5/8 (ICES), BLG 15/5/9, BLG 15/5/10 and BLG 15/INF.6 (United States), and BLG 14/5/2 and BLG 15/INF.4 (Brazil);
- .2 consideration of documents on draft Procedure for approving other methods of ballast water management in accordance with regulation B-3.7 of the BWM Convention, taking into account documents BLG 15/5 (Australia *et al.*) and BLG 15/5/7 (Canada);
- .3 consideration of the document on scaling of ballast water management systems, taking into account document BLG 15/5/2 (Germany and Norway); and
- .4 consideration of other information related to ballast water management and control, taking into account document BLG 15/5/3 (Secretariat).

Development of a BWM circular on ballast water sampling and analysis protocols

5.6 The Sub-Committee recalled that BLG 14 agreed that sampling and analysis continues to be a high priority, with ramifications related to the Guidelines for port State control under the BWM Convention, currently under development by the FSI Sub-Committee, and urged Member Governments and international organizations to submit technical contributions to the development of the BWM circular to provide ballast water sampling and analysis protocols, taking into account the *aide-memoire* developed at BLG 13.

5.7 In considering the submissions under this heading, the Sub-Committee noted that documents BLG 15/5/1, BLG 15/5/4, BLG 15/5/5 and BLG 15/5/6 (Austria *et al.*) provided a basis for the development of a circular on ballast water sampling and analysis protocols.

5.8 Having discussed document BLG 15/5/8 (ICES), providing an overview of the statistical methods that could be used to verify compliance with the D-2 standard, the Sub-Committee agreed to refer this information to the working group.

5.9 In considering documents BLG 15/5/9 and BLG 15/5/10 (United States), providing suggestions on how to determine and quantify low concentrations of living organisms, the Sub-Committee noted the recommendations contained therein and agreed to refer them to the working group for further consideration. The Sub-Committee also noted the information contained in document BLG 15/INF.6 (United States).

5.10 The Sub-Committee noted the information contained in document BLG 15/INF.4 (Brazil) and invited Member Governments and international organizations to share similar information on ballast water sampling and analysis.

5.11 The Sub-Committee noted the statement by the delegation of Brazil that they supported, in principle, the proposals in documents BLG 15/5/1, BLG 15/5/4, BLG 15/5/5 and BLG 15/5/6 and their use as a basis for the development of a BWM circular on ballast water sampling and analysis protocols. Brazil also indicated its intention to provide further technical contribution in the working group.

5.12 The observer of ICS expressed its concern with regard to some of the principles embodied into the proposals submitted under this heading, with specific reference to confirming compliance, sample handling, continuous sampling and consistency among various guidance documents and the provisions of Guidelines for approval of ballast water management systems (G8). Also, on the issue of consistency, the observer from IACS emphasized the need to ensure the alignment of the sampling process on board ship with that carried out pursuant to type approval under Guidelines (G8) cautioning on the awkward situation where a system which has been tested on the basis of average concentration values is susceptible to being found non-compliant if protocols for sampling are developed to deal with the "spikes" in organism numbers.

5.13 In supporting the concerns expressed by ICS and IACS with respect to consistency, the delegation of Panama indicated that additional clarification was needed with regard to viability of organisms during sampling.

5.14 Having considered the above views, the Sub-Committee agreed to instruct the Ballast Water and Biofouling Working Group to consider documents BLG 15/5/1, BLG 15/5/4, BLG 15/5/5 and BLG 15/5/6 as the basis for further development of the BWM circular on ballast water sampling and analysis protocols, taking into account documents BLG 15/5/8, BLG 15/5/9, BLG 15/5/10, BLG 15/INF.4 and BLG 15/INF.6 and the discussion in plenary, and provide a clear indication of the future work that may be necessary, including whether a correspondence group is needed to finalize the above circular.

Draft Procedure for approving other methods of ballast water management in accordance with regulation B-3.7 of the BWM Convention

5.15 The Sub-Committee recalled that MEPC 56 had agreed on the need to develop the "Procedure for approving other methods of ballast water management in accordance with regulation B-3.7 of the BWM Convention" and instructed the Sub-Committee accordingly.

5.16 The Sub-Committee also recalled that, having considered document BLG 14/5/1 (Netherlands *et al.*), containing a draft of the Procedure for approving other methods of ballast water management in accordance with regulation B-3.7 of the BWM Convention, BLG 14 had encouraged Member Governments and international organizations to contact the co-sponsors of the above document to contribute to the development of an updated version of the Procedure that could be submitted to BLG 15.

5.17 Following consideration of documents BLG 15/5 (Australia *et al.*), containing an updated version of the Procedure for approving other methods of ballast water management in accordance with regulation B-3.7 of the BWM Convention, and BLG 15/5/7 (Canada), containing a proposal to utilize ballast water exchange in combination with a ballast water management system to achieve an enhanced level of protection, the Sub-Committee noted the intervention by the delegation of Panama, which pointed out that no criteria for approval of "Other Methods" in accordance with regulation B-3.7 of the BWM Convention seemed to be provided and identified a number of contradictions in section 2 of the annex to document BLG 15/5.

5.18 The delegations of Ukraine, the United Kingdom and ICS expressed concern with regard to the proposal to combine ballast water exchange with ballast water treatment, as contained in document BLG 15/5/7, and cautioned on the additional requirements such proposal may involve, its efficiency, the increased costs and the risks to the ship and crew.

5.19 The Sub-Committee agreed to refer documents BLG 15/5 and BLG 15/5/7 to the Ballast Water and Biofouling Working Group for detailed consideration and instructed the group to consider document BLG 15/5 (Australia *et al.*) as the basis for further development of the Procedure for approving other methods of ballast water management in accordance with regulation B-3.7 of the BWM Convention, taking into account the discussion held in plenary.

Scaling of ballast water management systems

5.20 The Sub-Committee recalled that BLG 14 agreed on the need to develop a guidance document on the scaling of ballast water management systems and requested Member Governments and international organizations to provide their contributions to facilitate the development of such guidance with a view to focusing on type approval process, computational fluid dynamics models, required physical testing and efficacy and using circular BWM.2/Circ.8 as a model.

5.21 Following the consideration of document BLG 15/5/2 (Germany and Norway), containing a revised draft of the guidance document on the scaling of ballast water management systems, the Sub-Committee noted the recommendations made by the observer from IACS and the concerns expressed by the delegations of the United Kingdom and ICS with regard to the need for appropriate testing and agreed to refer this document to the Ballast Water and Biofouling Working Group for detailed consideration.

Other information related to ballast water management and control

5.22 Having noted the information provided in document BLG 15/5/3 (Secretariat), on development of standardized protocols for ballast water testing facilities, the Sub-Committee requested the Secretariat to continue to provide regular updates on the progress made in this respect.

Establishment of the working group

5.23 Having considered the above matters, the Sub-Committee established the Working Group on Ballast Water and Biofouling (see also paragraph 9.8) and instructed it, taking into the comments made and decisions taken in plenary, to:

- .1 develop a BWM circular to provide ballast water sampling and analysis protocols and to give advice on the uniform application of these protocols, using the text contained in the annexes to documents BLG 15/5/1, BLG 15/5/4, BLG 15/5/5 and BLG 15/5/6 as a starting point, taking into account the information and comments contained in documents BLG 15/5/8, BLG 15/5/9, BLG 15/5/10, BLG 15/INF.4, BLG 14/5/2 and BLG 15/INF.6;
- .2 finalize the "Procedure for approving other methods of ballast water management in accordance with regulation B-3.7 of the BWM Convention", using document BLG 15/5 as a base document, taking into account the proposal made in document BLG 15/5/7;

- .3 consider document BLG 15/5/2 with the view to developing a BWM circular on Scaling of ballast water management systems, which could be updated periodically to reflect the progress in science and engineering; and
- .4 prepare recommendations for MEPC 62, for consideration by the Sub-Committee.

Report of the working group

5.24 Having considered the part of the report of the working group (BLG 15/WP.4) relating to this agenda item, the Sub-Committee approved the report in general and took action with respect to ballast water issues, as outlined hereunder.

Procedure for approving Other Methods of ballast water management in accordance with regulation B-3.7 of the BWM Convention (Other Methods for BWM)

5.25 The Sub-Committee agreed to the draft MEPC resolution on Procedure for approving other methods of ballast water management in accordance with regulation B-3.7 of the BWM Convention, as set out in annex 4, for submission to MEPC 62 for adoption.

5.26 The Sub-Committee noted that, due to time constraints, the group was unable to consider document BLG 15/5/7 and agreed to refer this document to BLG 16.

Scaling of ballast water management systems

5.27 The Sub-Committee agreed to the draft BWM circular on Guidance on scaling of ballast water management systems, as set out in annex 5, for submission to MEPC 62 for approval.

Development of a technical circular on ballast water sampling and analysis protocols

5.28 The Sub-Committee endorsed the decision of the group to summarize the existing information on methods for sampling and analysis into a table and to combine some of the narrative text contained in documents BLG 15/5/1, BLG 15/5/4, BLG 15/5/5 and BLG 15/5/6 with the information compiled in that table as a way forward to develop a draft BWM circular on Ballast water sampling and analysis.

5.29 The Sub-Committee noted that, although the group made significant progress in addressing the various aspects related to sampling and analysis, due to time constraints, it was unable to complete the work. The Sub-Committee agreed that additional time is needed to discuss in-depth all the issues identified with a view to completing a BWM circular on Ballast water sampling and analysis.

5.30 The observer from IACS, supported by the delegation of the Bahamas and the observer from ISMA, pointed out that operational issues should be integral to the sampling protocols and being further concerned about the apparent lack of consistency between the protocols and Guidelines (G8), suggested additional text for the terms of reference of the correspondence group to be inserted for this item.

Establishment of the correspondence group

5.31 Having considered the above matters, the Sub-Committee established the Correspondence Group on the Development of a BWM Circular on Ballast Water Sampling and

Analysis, under the coordination of the European Commission^{*}, and instructed it to:

- .1 develop further the draft BWM circular on ballast water sampling and analysis using the documents submitted at this session, the *aide-memoire* contained in documents BLG 13/18 (annex 6) and BLG 14/INF.6 and the guidance contained in paragraphs 23 to 27 of document BLG 15/WP.4, and provide a reasoned explanation regarding the compatibility of this guidance with the Guidelines for approval of BWM systems (G8);
- .2 identify and compile the operational issues involved in sampling with regard to port State control, as contained in documents BLG 15/5/1, BLG 15/5/4, BLG 15/5/5 and BLG 15/5/6, to facilitate the implementation of the BWM Convention; and
- .3 submit a written report to BLG 16.

5.32 In this regard, the Sub-Committee, having noted that the aforementioned draft BWM circular on Ballast water sampling and analysis will be finalized at BLG 16, invited MEPC 62 to consider the above circular at MEPC 63 as an urgent matter taking into account the close proximity between BLG 16 and MEPC 63 (see paragraph 16.11).

5.33 Taking into account that technologies and expertise regarding ballast water management are constantly increasing, the Sub-Committee also urged Member Governments and international organizations to submit comments and information on new methodologies with regard to ballast water sampling and analysis to assess compliance with the BWM Convention to BLG 16, taking into consideration the *aide-memoire* developed by BLG 13.

Future work on this output

5.34 In light of the remaining work and in anticipation of the entry into force of the BWM Convention, the Sub-Committee agreed to re-establish the working group at BLG 16, with the provisional terms of reference set out in annex 4 to document BLG 15/WP.4.

6 CODE OF SAFETY FOR SHIPS USING GAS OR OTHER LOW-FLASH POINT FUELS WITH PROPERTIES SIMILAR TO LIQUEFIED NATURAL GAS

General

6.1 The Sub-Committee recalled that MSC 86 had adopted resolution MSC.285(86) on Interim Guidelines on safety for natural gas-fuelled engine installations in ships and that, having noted that this Sub-Committee had commenced work on the development of an international code for ships using gas as fuel, had agreed to extend the target completion year to 2012.

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6.2 The Sub-Committee also recalled that BLG 14 had agreed to expand the scope and title of this output, to include low flashpoint liquid fuels in the Code, renaming the output as "Code of safety for ships using gas or other low-flash point fuels with properties similar to liquefied natural gas" and that MSC 87 had approved the aforementioned justification with a target completion year of 2012.

6.3 The Sub-Committee further recalled BLG 14, having agreed to the revised structure and functional requirements of the Code (BLG 14/WP.5), re-established the Correspondence Group on Development of the IGF Code with the terms of reference set out in paragraph 6.17 of document BLG 14/17 and instructed the group to submit a report to this session.

Report of the correspondence group

6.4 The Sub-Committee had for its consideration the report of the correspondence group (BLG 15/6), whereby the group, using the Interim Guidelines on safety for natural gas-fuelled engine installations in ships (resolution MSC.285(86)), as a basis, had further developed the framework, structure and functional requirements of the Code. In this regard, the Sub-Committee noted the group's view that it would be premature to refer the various chapters to other sub-committees for their consideration at this session, as originally decided by BLG 14, taking into account that many issues still need to be resolved.

6.5 The Sub-Committee also had for its consideration the following documents commenting on the report of the correspondence group:

- .1 BLG 15/6/1 (France), proposing that the working group be instructed to consider if membrane containment systems for gas cargoes, which have been in use on LNG tankers for over 40 years without serious accident, will meet the functional requirements set out in section 7.2 of the draft IGF Code; and
- .2 BLG 15/6/2 (Japan), expressing the view that clear criteria is needed for the application of the risk analysis provisions in the new Code and, to facilitate the work on this matter, Japan is conducting a hazard identification on conceptual designs of LNG fuelled ships and will provide the outcome of its research to BLG 16.

6.6 In considering the report of the correspondence group together with the above documents, the Sub-Committee took action as indicated in paragraphs 6.7 to 6.9.

Development of technical requirements for fuels to be included in the Code

6.7 Having noted that the group initially agreed to develop general requirements for all fuels to which the Code would apply, which were to be supplemented by additional chapters for each specific fuel, the Sub-Committee noted that the correspondence group was of the view that more operational experience, field data and research related to low-flash point fuels and gases other than LNG are needed in order to develop specific technical requirements. In considering the above view, the Sub-Committee agreed that the working group should develop provisions for all fuels covered by the Code in line with the decision of BLG 14, taking into account the proposal contained in annex 3 to document BLG 15/6.

Reproduction of the appropriate text from the revised IGC Code

6.8 The Sub-Committee considered the group's views regarding whether or not to incorporate the relevant provisions from the revised IGC Code into the new IGF Code and agreed that the new IGF Code should be an independent Code without the need for making reference to the IGC Code. In this regard, the Sub-Committee, noting that the revised IGC Code is still under development, agreed that the provisions of the two Codes should be harmonized, as appropriate, taking advantage of the experience gained over the past 25 years with the implementation of the IGC Code. Consequently, the Sub-Committee decided that the working group should identify any issues that impact the expected target completion year of this output, taking into account document BLG 15/6/2 and the concerns raised by the correspondence group (BLG 15/6, paragraphs 7 to 12), and advise the Sub-Committee accordingly.

Establishment of the working group

6.9 Following the above discussion, the Sub-Committee established the Working Group on the Code of Safety for Ships using Gas or Other Low-flash Point Fuels (the IGF Code) and instructed it, taking into consideration the report of the correspondence group (BLG 15/6) and the comments and decisions made in plenary, to:

- .1 further develop the draft Code of safety for ships using gas or other low flashpoint fuels with properties similar to liquefied natural gas, based on annex 1 to document BLG 15/6, taking into account annexes 2 and 3 of document BLG 15/6, with the view to developing an independent Code;
- .2 consider whether existing membrane containment systems would meet the functional requirements, taking into account document BLG 15/6/1;
- .3 identify any issues that would impact the expected target completion year of this output, taking into account document BLG 15/6/2 and the concerns raised by the correspondence group (BLG 15/6, paragraphs 7 to 12), and advise the Sub-Committee accordingly;
- .4 consider whether there is a need to re-establish the correspondence group and, if so, prepare the terms of reference for consideration by the Sub-Committee; and
- .5 submit a written report (part 1) by Thursday, 10 February 2011, for tasks set out in subparagraphs .3 and .4 above, including a report on the progress on subparagraphs .1 and .2 above, and continue working through the week on the remaining tasks and submit part 2 of the report to BLG 16, as soon as possible after this session so that it can be taken into account by the correspondence group, if established.

Report of the working group

6.10 Having considered the report of the working group (part 1) (BLG 15/WP.5), the Sub-Committee approved it in general and took action as outlined hereunder.

SMART terms

6.11 The Sub-Committee, taking into account the decisions of C 104 on the use of SMART terms for the outputs to be included in the biennial agenda for the 2012-2013 biennium, agreed to include the word "International" in the title of the Code and rename the output and Code to the "International Code of Safety for Ships Using Gases or Other Low Flashpoint Fuels (IGF Code)".

Harmonization between IGC and IGF Codes

6.12 The Sub-Committee endorsed the group's decision that, as far as possible, the draft revised IGC Code and the new IGF Code should be harmonized with a focus on, but not limited to, the issues addressed in chapter 16 of the draft revised IGC Code, recognizing that the IGF Code has broader implications that would need to be considered separately. The Sub-Committee also noted that the group had identified those sections contained in the IGC Code that are relevant to the requirements of the IGF Code, for further consideration by the correspondence group (see paragraph 6.16), bearing in mind that the draft revised IGC Code mainly addresses cargo and that the identified sections should be reconsidered to fit the purpose of the IGF Code.

Progress made on the development of the IGF Code

6.13 The Sub-Committee noted the general progress made by the group (BLG 15/WP.5, paragraphs 9 to 26 and 28), in particular the comments made and the decisions taken on the application of the Code regarding all relevant fuels, emergency shutdown (ESD) concept, location of tanks, maximum assumed pipe failure, portable tanks, ventilation of engine crankcases and the risk analysis provisions.

Membrane containment systems

6.14 The Sub-Committee endorsed the group's view that, if the requirements for fuel containment systems are met, any containment systems would be permitted under the IGF Code, including membrane containment systems, as addressed in document BLG 15/6/1.

Action plan and target completion year

6.15 The Sub-Committee, having considered the action plan prepared by the working group (BLG 15/WP.5 paragraphs 29 and 30 and annex), endorsed the group's recommendation to extend the target completion year to 2014.

Establishment of a joint correspondence group

6.16 The Sub-Committee established the joint Correspondence Group on Development of the IGF and IGC Codes (see also paragraph 10.9), under the coordination of Norway,* and instructed it, taking into account second part of the working group's report (BLG 16/6), to:

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- .1 further develop the draft International Code of Safety for Ships Using Gases or Other Low Flashpoint Fuels (IGF Code), based on annex 1 to document BLG 15/6 and the decisions contained in document BLG 15/WP.5;
- .2 consider the draft revised IGC Code, as contained in document BLG 15/INF.2, taking into account the work on the revision of the IGC Code, and identify issues for harmonization and/or inclusion in the draft IGF Code;
- .3 further identify potential limitations of the application of the ESD concept, as defined in the Interim Guidelines and paragraph 2.6.3 within the draft IGF Code; and
- .4 submit a report to BLG 16.

7 CASUALTY ANALYSIS

7.1 The Sub-Committee noted that no documents had been submitted for consideration at this session and that this is a continuous output that remains on the agenda pending the outcome, if any, of the FSI Sub-Committee for consideration.

8 CONSIDERATION OF IACS UNIFIED INTERPRETATIONS

8.1 The Sub-Committee recalled that MSC 78 instructed the sub-committees to consider any submitted IACS unified interpretations with a view to developing appropriate IMO interpretations, if deemed necessary.

8.2 The Sub-Committee noted that no interpretations had been submitted to this session.

9 DEVELOPMENT OF INTERNATIONAL MEASURES FOR MINIMIZING THE TRANSFER OF INVASIVE AQUATIC SPECIES THROUGH BIOFOULING OF SHIPS

9.1 The Sub-Committee recalled that MEPC 56 had approved the inclusion of a new output on "Development of international measures for minimizing the transfer of invasive aquatic species through biofouling of ships", for inclusion in the Sub-Committee's biennial agenda, with the target completion year of 2010 and noted that, in view of the significant volume of the work required, MEPC 61 had agreed to extend the target completion year for this output to 2012.

9.2 The Sub-Committee also recalled that, recognizing the need to expedite the work on this output, BLG 14 had re-established the Correspondence Group on the Development of International Measures for Minimizing the Transfer of Invasive Aquatic Species through Biofouling of Ships with the terms of reference set out in paragraph 9.16 of document BLG 14/17 and instructed the group to submit a report to this session.

9.3 The Sub-Committee further recalled that BLG 14 had agreed to re-establish the Ballast Water and Biofouling Working Group at this session to deal with agenda item 5 (Development of guidelines and other documents for uniform implementation of the 2004 BWM Convention) and this agenda item, with the provisional terms of reference set out at annex 5 to document BLG 14/17.

Report of the correspondence group

9.4 In considering the report of the correspondence group (BLG 15/9), the Sub-Committee noted the various tasks carried out by the group since BLG 14 in accordance with its terms of reference and, in particular, of the progress made in the development of the Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species.

9.5 In considering document BLG 15/9/1 (Japan), commenting on the report of the correspondence group, the Sub-Committee noted the recommendations on small recreational craft and possible criteria for evaluating the Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species and views expressed regarding the need for practicality, flexibility and emphasis on the non-mandatory nature of these Guidelines.

9.6 In this regard, the Sub-Committee noted the statement by the delegation of Brazil on the need to finalize the Guidelines on biofouling and with regard to guidance on recreational craft smaller than 24 metres, expressing its preference for Option 3, as contained in document BLG 15/9 (New Zealand).

9.7 The observers of ICS and IPPIC supported the views expressed by Japan with regard to the need for practicality and recommended to avoid size-based criteria for capturing the material resulted from in-water cleaning.

9.8 Following the discussion, the Sub-Committee agreed that the Ballast Water and Biofouling Working Group, established under agenda item 5 (Development of guidelines and other documents for uniform implementation of the 2004 BWM Convention), should be instructed to finalize, as a matter of priority, the draft Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species, using annexes 1 and 4 to document BLG 15/9 as the basis, taking into consideration the discussion held in plenary, with the view to its adoption as an MEPC resolution by MEPC 62. The Sub-Committee also agreed that the aforementioned working group should be instructed to assess the remaining work on ships' biofouling and propose an appropriate course of action.

Instructions to the Ballast Water and Biofouling Working Group

9.9 Having considered the above ship biofouling issues, the Sub-Committee instructed the Ballast Water and Biofouling Working Group, established under agenda item 5 (see paragraph 5.19), to:

- .1 finalize, as a matter of priority, the draft Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species together with the draft MEPC resolution for their adoption, using annexes 1 and 4 to document BLG 15/9 as the basis, taking into consideration the recommendations contained in document BLG 15/9/1 and the discussions held in plenary;
- .2 time permitting, consider the options for providing guidance to the recreational sector in managing biofouling, as summarized in paragraph 14 of the report of the correspondence group (BLG 15/9), and finalize the draft Guidelines/guidance document for recreational craft less than 24 metres in length using annex 2 and/or 3 to document BLG 15/9 as the basis;

- .3 consider the draft time frame, criteria and process for evaluating the effectiveness of the Guidelines, using annex 5 to document BLG 15/9 as a base document; and
- .4 consider the need for the development of a guidance document on disposal of biofouling waste in land-based facilities and advise the Sub-Committee accordingly.

Report of the working group

9.10 Having considered the part of the report of the working group (BLG 15/WP.4) related to this agenda item, the Sub-Committee took the following action with respect to ship biofouling issues:

- .1 agreed to the draft MEPC resolution on Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species, as set out in annex 6, for adoption by MEPC 62;
- .2 endorsed the decision of the group to include all ships within the scope of the Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species and to develop a separate guidance document that provides advice for owners and/or operators of recreational craft less than 24 metres in length based on annex 3 to document BLG 15/9; and
- .3 noted that, due to time constraints, the group was unable to finalize the discussion on the time frame, criteria and process for evaluating the effectiveness of the Guidelines and to consider the term of reference relating to the potential need for guidance on the disposal of in-water cleaning material to land-based facilities.

9.11 In light of the considerable time needed to finalize the work on this output, the Sub-Committee agreed to re-establish the Ballast Water and Biofouling Working Group at BLG 16 with the terms of reference set out in annex 4 to document BLG 15/WP.4.

10 REVISION OF THE IGC CODE

General

10.1 The Sub-Committee recalled that MSC 83, having considered a proposal by the United Kingdom and SIGTTO (MSC 83/25/15), had agreed to include, in the Sub-Committee's work programme, a high-priority item on "Revision of the IGC Code", in cooperation with the FP, DE, SLF and STW Sub-Committees, as necessary and when requested by the BLG Sub-Committee. In this regard, the Sub-Committee noted that the original scope of the output, as agreed by MSC 83, was to review all areas of the IGC Code with a view to revising and updating the Code and, where necessary, to identify other instruments which may be affected and require consequential amendments, taking into account the latest technologies, operational practices and the increasing size of the newest ships.

10.2 The Sub-Committee also recalled that BLG 12 had emphasized the ongoing development of goal-based standards by the MSC and was of the opinion that it would be appropriate to exercise caution and prudence to ensure that a goal-based approach is taken in the review of the IGC Code, but not develop specific goal-based standards for the Code.

10.3 The Sub-Committee further recalled that BLG 14, having noted the intention of SIGTTO to submit a draft text of the IGC Code to BLG 15, invited Member Governments and international organizations to submit their comments on the draft Code to be submitted and invited the Committee to extend the target completion year of this output to 2014.

10.4 The Sub-Committee noted that document BLG 15/10/3 (United Kingdom), providing details of a new product (Mixed C4) for inclusion in chapter 19 of the revised IGC Code, was already dealt with under agenda item 3 (Evaluation of safety and pollution hazards of chemicals and preparation of consequential amendments) (see paragraphs 3.9 and 3.14.7).

Outcome of the Industry Steering Committee

10.5 The Sub-Committee had for its consideration documents BLG 15/10 and BLG 15/INF.2 (United Kingdom and SIGTTO), containing the report on the outcome of the industry steering group established to assist with the revision of the IGC Code. In this regard, the Sub-Committee noted that the above work was carried out by a broad cross section of industry representatives, including the establishment of a Steering Committee, which consisted of 19 senior industry representatives from around the world. The Steering Committee was supported by 10 working groups each of which examined different sections of the Code and prepared proposed revisions as necessary, including a group to advise on matters related to goal-based standards, which was supported by experts from classification societies, liquefied gas ship operators, shipyards specializing in construction of these ships, and other relevant bodies, each reporting back to the Steering Committee. In this regard, the Sub-Committee noted that, in total, 129 experts from 48 different organizations and 18 countries had been actively involved in the work on the revision of the Code.

10.6 The Sub-Committee expressed its appreciation to the United Kingdom, SIGTTO, the Industry Steering Committee and the other participants for their excellent work. In considering the outcome and recommendations made by the Steering Committee, the Sub-Committee noted that the work undertaken on the revision of the IGC Code did take into account the GBS structure, although it was pointed out that the Steering Committee could not fully embrace the GBS concept in its entirety. Nevertheless, the Sub-Committee noted that each chapter of the revised Code was modified to include a new section on "Goals", which is similar to the structure of the revised SOLAS chapter II-2.

Consideration of how best to proceed on this output

10.7 In considering how best to proceed in light of the progress made to date, the Sub-Committee took into account document BLG 15/10/1 (Germany), proposing that a correspondence group be established at this session to review the draft revised IGC Code with a view to also establishing a working group at BLG 16 as well as the comment by Japan highlighting the issues that require cautious consideration, and agreed that the draft IGC Code (BLG 15/INF.2) should be further considered intersessionally with a view to referring the relevant parts of the draft Code to the FP, DE, SLF and STW Sub-Committees, after BLG 16, for consideration of the parts that fall under their respective purviews (see paragraph 10.9).

Proposed amendments to the draft revised IGC Code

10.8 The Sub-Committee considered the following documents:

- .1 BLG 15/10/2 (Germany and Norway), providing draft guidance on limit state design of cargo containment systems for inclusion in section 4.26 of the draft revised IGC Code;
- .2 BLG 15/10/4 (United Kingdom), proposing additional wording, amendments and minor editorials to improve the text of the draft IGC Code; and
- .3 BLG 15/10/5 (Norway), containing comments and proposals on chapters 5, 7, 10, 13, 16 and 18 of the draft revised IGC Code,

and agreed that the above proposed modifications should be considered intersessionally for incorporation into the draft revised IGC Code, taking into account the comments and decisions made in plenary.

Instructions to the joint correspondence group

10.9 Recognizing the need to make progress on this output, the Sub-Committee instructed the joint Correspondence Group on Development of the IGF and IGC Codes, established under agenda item 6 (see paragraph 6.16), to further develop the draft IGC Code, using the draft text set out in the annex to document BLG 15/INF.2 as a base document, taking into account the comments and decisions made at BLG 15 and documents BLG 15/10, BLG 15/10/1, BLG 15/10/2, BLG 15/10/4 and BLG 15/10/5, and in particular to:

- .1 identify editorial amendments to the proposed draft text and include them in the text of the draft IGC Code;
- .2 identify those parts of the text that are required to be forwarded to other IMO bodies and the relevant IMO bodies to be involved;
- .3 seek alignment of the concepts in the parts of the text of the draft IGC Code which overlap with the draft IGF Code (BLG 15/6 and BLG 15/WP.5), with regard to the following chapters and associated matters to be considered:
 - .1 chapter 1 (maintenance);
 - .2 chapter 2 (damage assumption);
 - .3 chapter 3 (tank location);
 - .4 chapter 5 (fuel gas piping);
 - .5 chapter 8 (exemptions in IGF Code);
 - .6 chapter 10 (hazard locations);
 - .7 chapter 12 (compressor, pump room);
 - .8 chapter 15 (filling limits);
 - .9 chapter 16 (entirety); and
 - .10 chapter 18 (training);

- .4 further consider certain technical issues with regard to the following chapters:
 - .1 chapter 1 (definition of "Gas Dangerous Space" still needed and provisional assessment procedure with appendix);
 - .2 chapter 2 (freeboard and stability (2.2: especially 2.2.5), location of cargo tanks (2.4), standard of damage (2.6));
 - .3 chapter 3 (accommodation, service and machinery spaces and control stations (3.2: especially 3.2.3), access to spaces in cargo area (3.5: especially 3.3.5));
 - .4 chapter 4 (heating of longitudinal hull structure (4.18.1.5) and limit state design, Type C independent tanks (4.22: especially 4.22.3));
 - .5 chapter 5 (testing requirements (5.13));
 - .6 chapter 6 (non-destructive testing (6.5.6), Table 6.2, Appendix 4);
 - .7 chapter 10 (especially example (10.3) and definition of "Hazardous area" related to other parts);
 - .8 chapter 11 (test requirements (11.2.5, 11.3.8, 11.4.9), water-spray system (11.3: application to semi-enclosed motor room));
 - .9 chapter 12 (spaces required to be entered during normal cargo handling operation (12.1: especially for cargo control room));
 - .10 chapter 13 (overflow control (13.3), automation system (13.8), system integration (13.9));
 - .11 chapter 14 (personal protection requirements for individual products (14.4: especially 14.4.3));
 - .12 chapter 18 (Entry into spaces (18.8), Table 18.1); and
 - .13 chapter 19 (Some change of gauging requirements); and
- .5 prepare draft explanatory notes describing the background for changes, in particular regarding chapters 3, 4 and 8 and on the limit state design concept.

11 REVIEW OF RELEVANT NON-MANDATORY INSTRUMENTS AS A CONSEQUENCE OF THE AMENDED MARPOL ANNEX VI AND THE NO_x TECHNICAL CODE

General

11.1 The Sub-Committee recalled that MEPC 61 had adopted, by resolution MEPC.192(61), the 2010 Guidelines for monitoring the worldwide sulphur content of residual fuel oils supplied for use on board ships which had been prepared by BLG 14.

11.2 The Sub-Committee also recalled that MEPC 61 had agreed to extend the target completion year of this output to 2012 to review of relevant non-mandatory instruments as a consequence of the amended MARPOL Annex VI and the NO_x Technical Code 2008.

11.3 The Sub-Committee recalled further that BLG 14, in order to make progress on the development of the draft Guidelines for certification of marine diesel engines fitted with selective catalytic reduction (SCR) systems and the draft Guidelines on the provision of reception facilities under MARPOL Annex VI, had established the Correspondence Group on Review of relevant non-mandatory instruments as a consequence of the amended MARPOL Annex VI and the NO_x Technical Code 2008 with the terms of reference set out in paragraph 12.31 of document BLG 14/17 and instructed the group to submit a report to this session.

11.4 The Sub-Committee further recalled that BLG 14 could not finalize the Guidelines for certification of marine diesel engines fitted with SCR systems, as a range of substantial issues were still outstanding, in particular, how the engine family concept may be applied to engines fitted with SCR after-treatment systems and whether certification of engines and SCR systems separately (certification Scheme B) would require an amendment to the NO_x Technical Code (NTC) 2008.

Outcome of MEPC 61

11.5 The Sub-Committee noted that MEPC 61, having considered documents MEPC 61/7/4 (Denmark, Germany and Japan) and MEPC 61/7/8 (Japan), proposing amendments to the NO_x Technical Code (NTC) 2008 concerning the testing of marine diesel engines to be fitted with a NO_x-reducing device, had agreed to refer the above-mentioned documents to BLG 15 for detailed consideration.

Report of the correspondence group

11.6 The Sub-Committee considered the report of the correspondence group (BLG 15/11 and BLG 15/INF.3) and noted that the group had further developed the draft Guidelines for certification of marine diesel engines fitted with SCR systems and the draft Guidelines for the provision of Annex VI reception facilities. However, the group did not consider amendments to the NO_x Technical Code 2008 as this matter was not part of its terms of reference.

11.7 The Sub-Committee also noted that the group had identified a number of critical aspects to the test procedure and application of Scheme B that needed to be resolved, including confirmation of the required load points for the on board confirmation test, allowance for the use of simulated gas for SCR chambers, application of Scheme B and continuous monitoring for engines equipped with an on-off NO_x control system.

Proposed amendments to the NO_x Technical Code 2008

11.8 The Sub-Committee had the following documents proposing amendments to the NO_x Technical Code 2008, to allow certification under Scheme B and providing related comments, for its consideration:

- .1 BLG 15/11/2 (EUROMOT), providing information on the impact of engine load and varying test mode points on specific and cycle weighted NO_x emissions, based on an example from a two-stroke main propulsion engine. EUROMOT maintained the view that modifications to the NO_x Technical Code 2008 were needed in order to offer a procedure enabling certification

for engines which cannot be pre-certified on a test bed. EUROMOT supported certification Scheme B proposed in document BLG 14/12/1 (Japan), in principle, however believed that further modification would be necessary.

- .2 MEPC 61/7/4 (Denmark, Germany and Japan), proposing to amend the NO_x Technical Code 2008 concerning the testing of large marine diesel engines to be fitted with a NO_x-reducing device as combined engine/SCR systems cannot be tested on a test bed without significant difficulties. To provide more flexibility in the test/certification process, the co-sponsors proposed to amend paragraph 2.2.5.1 of the NO_x Technical Code 2008.
- .3 MEPC 61/7/8 (Japan), providing technical background for the proposed amendments to the NO_x Technical Code 2008 contained in document MEPC 61/7/4. Japan reiterated the necessity to amend the NO_x Technical Code 2008 to introduce a certification procedure of testing by Scheme B, in order to avoid difficulties for certification by Scheme A for large-sized engine and SCR systems, and to ensure smooth implementation of the Tier III NO_x limit.
- .4 BLG 15/11/3 (Japan), providing technical data to confirm the robustness and practicability of certification Scheme B. Japan conducted confirmation tests, by testing with engine exhaust gas (corresponding to Scheme A) and by testing with simulated gas (corresponding to Scheme B), using two kinds of reductant agents (NH₃ and 40% Urea). The results indicated that the maximum deviation of NO_x reduction rates between the two schemes was 4.5%.

11.9 In considering the above documents, the Sub-Committee noted that the majority of delegations that spoke on the matter supported the view that the existing testing schemes in the NTC 2008 are not suitable for some engines fitted with SCR systems and that a suitable additional certification scheme for such engines is needed. Such a scheme should provide equivalent compliance to the existing testing schemes, and be fully documented to enable the procedure to be traceable.

11.10 One delegation advocated that the existing testing methods within the NTC 2008 could be suitable for engines fitted with SCR or other NO_x-reducing devices and considered that the proposed Scheme B would be in contravention of the existing NTC 2008.

11.11 For the on board confirmation test, some delegations emphasized a need for testing at maximum achievable load point or at a load point as close to 100% Maximum Rated Power as possible. However, the majority of delegations were in favour of testing at 25%, 50% and 75% of rated power, independent of test cycle.

11.12 Some delegations were of the view that application of engine size for Scheme B should be limited only to large engines. However, the majority of delegations supported the view that an engine size limit for application of Scheme B should not be established as Scheme B would be applied only where the combined testing is not appropriate due to technical or practical reasons.

11.13 Following a thorough debate of the different issues, the Sub-Committee agreed that an additional certification scheme is required for some engines fitted with SCR systems and that the proposed Scheme B for such engines should be included in the draft Guidelines. Subsequently, the Sub-Committee agreed that:

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- .1 amendments to the NTC 2008 are necessary to permit certification Scheme B;
 - .2 the requirement for the on board confirmation testing at 25%, 50% and 75% of rated power, independent of test cycle, should be included in the draft Guidelines;
 - .3 allowance for use of simulated gas for SCR chambers specified in paragraph 5.3.2.1.2 of the draft Guidelines should be retained; and
 - .4 an engine size limit for application of Scheme B should not be established.

11.14 The Sub-Committee agreed that a drafting group should be instructed to review and finalize the draft Guidelines, using annex 1 to document BLG 15/11 as the basis, and to develop draft amendments to the NO_x Technical Code 2008 relating to certification Scheme B, as necessary.

Draft Guidelines for the provision of MARPOL Annex VI reception facilities

11.15 The Sub-Committee considered draft Guidelines for the provision of Annex VI reception facilities, as set out in annex 2 to the report of the Correspondence Group (BLG 15/11), and agreed that the drafting group should review and finalize the draft Guidelines using annex 2 to document BLG 15/11 as the basis.

Fuel oil quality

Revised specification of marine fuels (ISO 8217:2010)

11.16 The Sub-Committee noted that MEPC 61 had instructed it to review the revised specification of marine fuels ISO 8217:2010, taking into account the proposals made in documents MEPC 61/4/7 (Norway and INTERTANKO) and MEPC 61/4/9 (OCIMF), as well as comments raised at that session.

11.17 The Sub-Committee noted that there were three separate issues to be considered: the revised marine fuel specification (ISO 8217:2010); the limit of hydrogen sulphide (H₂S); and a proposed new mechanism for quality control of bunkers.

11.18 The Sub-Committee considered relevant parts of document BLG 15/11/4 (Norway and INTERTANKO), proposing to include in the Bunker Delivery Note selected parameters that ISO considered relevant to seafarers' health, safety of the ship and air emissions.

11.19 The Sub-Committee considered document BLG 15/11/5 (IBIA and BIMCO), stressing that the ambition of bringing all 23 parameters in the ISO marine fuel specification together with the additional content of the 8 main clauses and 12 annexes might be beyond the scope of a simple addition to MARPOL Annex VI, especially as some of the provisions of ISO 8217:2010 might be incompatible with some of the provisions of MARPOL Annex VI. The co-sponsors proposed that a correspondence group be established to select those parameters and elements of fuel quality which have the greatest impact on safety, environmental pollution and health, and can be readily quantified and assayed at the delivery location.

11.20 The Sub-Committee considered relevant parts of document BLG 15/11/6 (IPIECA), explaining that it would be inappropriate to make compliance with ISO 8217:2010 a legal requirement by incorporating it in MARPOL Annex VI. Deviations on any fuel parameters that do not lead to significant environmental consequences should remain within the scope of the commercial agreement between the supplier and the customer, and should not automatically constitute a "breach of the law".

11.21 The Sub-Committee exchanged views on the matter with some delegations reiterating that disputes over the quality of fuel oil supplied is a commercial matter between the supplier and customer, and that inclusion of additional parameters in the Bunker Delivery Note would lead to those parameters becoming, by default, mandatory as the BDN is a mandatory document. It was stressed that the matter had been considered before both by BLG and MEPC with the result that ISO had been invited to update the marine fuel oil specification which they had now completed with the publication of ISO 8217:2010.

11.22 Other delegations expressed the view that fuel quality was the key issue for compliance with MARPOL Annex VI and that the introduction of additional parameters into the Bunker Delivery Note would improve the transparency in the supply chain.

11.23 Several delegations raised concerns over the potential restrictions on the development of alternative fuels and technologies under regulation 4 of MARPOL Annex VI, which had been fundamental in a number of Member Governments ratifying MARPOL Annex VI, that may result as a consequence of inclusion of new parameters, and that as with any regulatory requirement there was a need to consider the practicality and enforceability of any additional provisions to regulation 18 of MARPOL Annex VI.

Limit of hydrogen sulphide (H₂S)

11.24 The Sub-Committee considered document BLG 15/11/1 (ISO), providing justification for the limit of hydrogen sulphide (H₂S) in the new ISO marine fuel specification (ISO 8217:2010). The observer from ISO emphasized that the maximum vapour phase level of H₂S released from a bunker fuel could be controlled by limiting the liquid phase level of H₂S. The observer from ISO invited the Sub-Committee to consider giving guidance to fuel oil handlers and users as to possible operational and technical measures to mitigate the risk of any incident resulting from H₂S gas evolving from marine fuel oils in service.

11.25 In considering document BLG 15/11/6, the Sub-Committee noted that IPIECA provided background information on H₂S limit specified in the ISO 8217:2010 when the ISO Technical Working Group had developed the specification.

11.26 The Sub-Committee considered document MEPC 61/4/9, providing comments on the inclusion of maximum limit for the hydrogen sulphide (H₂S) in the revised specification of marine fuels, ISO 8217:2010, and noted the recommendation of OCIMF that the level in supplied marine fuel oils of hydrogen sulphide should be kept as low as possible, and should be measured in the vapour stage using normal operational conditions of pressure and temperature.

11.27 In considering document BLG 15/11/4, the Sub-Committee noted that the co-sponsors supported the view that the level of H₂S in supplied marine fuels should be kept as low as possible and it should be measured in the vapour phase using a prescribed standard method reflecting normal operational conditions of pressure and temperature.

11.28 The Sub-Committee noted that the exposure to hydrogen sulphide (H₂S) vapour given off by fuel oils could pose a risk to the seafarer, however, with the exception of oil tankers carrying crude oil cargoes, there was insufficient evidence to consider the exposure to be a significant risk to seafarers.

11.29 In this respect, the observer from CEFIC, referring to the scientific relationship between risk and hazard, indicated that through appropriate preventive measures the hazard of hydrogen sulphide exposure from ships bunkers could be reduced and maintained at a safe level.

New mechanism for quality control of bunkers

11.30 The Sub-Committee considered relevant parts of document BLG 15/11/4 (Norway and INTERTANKO), proposing a new mechanism for quality control of bunkers delivered to ships, in which port authorities should introduce specific criteria and requirements for the operation of local bunker suppliers; make registry of locally recognized bunker suppliers available to IMO; audit/inspect the local suppliers; and forbid fuel blending on board supply barges.

11.31 In this respect, the observer from INTERTANKO emphasized that there is a specific need for verification of compliance with MARPOL Annex VI for fuel oils blended on board bunker barges.

11.32 Following extensive discussion on matters related to the revised specification of marine fuels (ISO 8217:2010), limit of hydrogen sulphide (H₂S), and a new mechanism for quality control of bunkers, as set out in paragraphs 11.16 to 11.31, the Sub-Committee agreed that more information and data is required to enable appropriate consideration of the matters.

11.33 The Sub-Committee agreed that the work of ISO and others has provided a base for further progress. However, consideration of the matter by the Sub-Committee at this session had made clear that there is no obvious way in which the Sub-Committee may take this forward.

11.34 Consequently, the proposal in document BLG 15/11/5, to establish a correspondence group on these matters, was not supported at this session.

Amendments to the Guidelines for exhaust gas cleaning systems (EGCS)

11.35 The Sub-Committee recalled that MEPC 59 had adopted the 2009 Guidelines for exhaust gas cleaning systems (2009 EGCS guidelines) (resolution MEPC.184(59)) and had agreed that the washwater discharge criteria should be revised in the future as more data becomes available on the contents of discharge and its effects, taking into account advice provided in document MEPC 59/4/19 (GESAMP).

11.36 The Sub-Committee recalled also that MEPC 61 had instructed it to consider amendments to the 2009 EGCS guidelines, taking into account the proposals made in documents MEPC 60/4/19 (IMarEST), MEPC 60/4/25 (Norway), MEPC 61/4/3 (United States) and MEPC 61/4/6 (France).

11.37 The Sub-Committee considered document MEPC 60/4/19 (IMarEST), proposing amendments to the 2009 EGCS guidelines with regard to washwater discharge criteria, and noted that IMarEST proposed that the washwater discharged outside port should have a pH of no less than 3.0, as compared with inside port limits of pH 6.5 and would submit an impact assessment of the pH 3.0 limit to the future session. IMarEST also proposed to correct a

clause for washwater monitoring and recording requirements for operation within and outside ports.

11.38 The Sub-Committee noted the information provided in document BLG 15/INF.7 (IMarEST), outlining ongoing research into dilution and dispersion of Exhaust Gas Cleaning Systems washwater committed by the Exhaust Gas Cleaning Systems Association (EGCSA). The work would be a combination of theoretical analysis supported by physical models, including variables such as washwater flow rate, pH value, injection angle and temperature, and was expected to be completed in 2011.

11.39 The Sub-Committee considered document MEPC 60/4/25 (Norway), proposing to examine the total framework regarding the use of regulation 4 of MARPOL Annex VI and the current content of the 2009 EGCS guidelines, and noted that Norway identified three issues to be solved: equivalence with regulation 14 from a technical and operational viewpoint; potential environmental problems associated with EGCS including the washwater discharge; and its legal and enforcement provisions for inspection and port States control regarding application of regulation 4 of MARPOL Annex VI.

11.40 In considering document MEPC 61/4/3 (United States), the Sub-Committee noted the United States response to several issues raised in documents MEPC 59/4/16 and MEPC 60/4/25 on the 2009 EGCS guidelines regarding demonstration of equivalence, including technical questions as well as approval, enforcement and compliance of EGCS. To prevent multiple revisions of the EGCS guidelines, the United States proposed to postpone a review of the 2009 EGCS guidelines until more data could be collected on washwater discharge.

11.41 In considering document MEPC 61/4/6 (France), the Sub-Committee noted the proposal to amend the 2009 EGCS guidelines to maximize the available data on discharge from EGCS in the shortest possible time. In particular, it was noted that France was of the view that it was premature to envisage a review of the 2009 EGCS guidelines at this stage since that would only delay the development of these systems and their wider testing under operational conditions.

11.42 The Sub-Committee recognized that availability of exhaust gas cleaning systems was of vital importance for effective implementation of MARPOL Annex VI and agreed that more time and examination was required to gather operational and technical data before considering further amendments to the 2009 EGCS guidelines.

11.43 The Sub-Committee noted the information provided in document BLG 15/INF.3 (Finland) on the composition and quality of washwater based on the results of an Exhaust Gas Cleaning System Test on board the **MT Suula**.

11.44 In considering the above submissions, the Sub-Committee exchanged views on the need for further amendments to be made to the 2009 EGCS guidelines, with some delegations referring to paragraph 18 of document MEPC 61/4/3, the need to retain a goal-based approach to the development of EGCS and the need to obtain further results. In order to avoid multiple revisions, the Sub-Committee decided, in principle, not to recommend any amendments of the 2009 EGCS guidelines at this session. Consequently, the Sub-Committee invited Member Governments and international organizations to submit to its future sessions the outcome and experiences in applying the 2009 EGCS guidelines, including relevant data and information, with the view that such information would put the Sub-Committee in a better position to conduct the review of the 2009 EGCS guidelines in future.

Other necessary guidelines and guidance documents regarding MARPOL Annex VI and the NO_x Technical Code 2008

11.45 The Sub-Committee noted that a number of other issues related to the revised MARPOL Annex VI and the NO_x Technical Code 2008, and their smooth implementation, were still outstanding and should be addressed at this session. Taking into account the target completion year of 2012 for this output, the Sub-Committee considered that the following list of guidelines and guidance remains valid and needs to be developed:

- .1 guidelines for replacement engines not required to meet the Tier III limit, as required under regulation 13.2.2 of MARPOL Annex VI;
- .2 guidelines called for under paragraph 2.2.5.6 of the revised NO_x Technical Code 2008 (NO_x-reducing devices);
- .3 guidance for water as a primary control measure, emulsification, charge air humidification or direct injection; and
- .4 guidance for gas fuels, natural gas or other gases as well as NO_x Technical Code calculation factors and specific issues relating to the testing of engines so fuelled.

Establishment of a correspondence group

11.46 To progress the development of the remaining guidelines and the guidance documents, the Sub-Committee established the Correspondence Group on Review of Relevant Non-mandatory Instruments as a Consequence of the amended MARPOL Annex VI and the NO_x Technical Code, under the coordination of the United States,* and instructed it to:

- .1 develop draft guidelines for replacement engines not required to meet the Tier III limit, as required under regulation 13.2.2 of MARPOL Annex VI;
- .2 develop the draft guidelines called for under paragraph 2.2.5.6 of the NO_x Technical Code 2008 (NO_x-reducing devices);
- .3 consider what guidance, if any, should be developed for water as a primary control measure, emulsification, charge air humidification or direct injection;
- .4 consider what guidance, if any, should be developed for gas fuels, natural gas or other gases as well as NO_x Technical Code calculation factors and specific issues relating to the testing of engines so fuelled; and
- .5 submit a report to BLG 16.

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Black Carbon

11.47 The Sub-Committee recalled that MEPC 58 had noted the information contained in document MEPC 58/INF.21 (FOEI), which provided a summary and analysis of various approaches to reduce emissions of climate forcing agents from international shipping, including information on the impact of Black Carbon. The Sub-Committee also recalled that MEPC 60, in considering document MEPC 60/4/24 (Norway, Sweden and United States), had a debate on whether separate actions were needed to reduce shipping emissions in the Arctic region and how this should relate to the general work on prevention of air pollution from ships under MARPOL Annex VI and the Organization's GHG work.

11.48 The Sub-Committee recalled further that MEPC 61 had agreed to invite interested Member Governments and international organizations to submit concrete proposals with specific measures to BLG 15.

11.49 The Sub-Committee noted the information in documents BLG 15/INF.5 and BLG 15/INF.8 (CSC), providing an updated report of a recent inventory of emissions of Black Carbon, organic carbon and sulphur dioxide emissions from international shipping activity in the Arctic, and a new scientific report conducted by a committee of international experts that assesses available information on Black Carbon.

11.50 The Sub-Committee noted document BLG 15/WP.8 (Secretariat), providing background information including an outline of possible approaches to address the issue of Black Carbon, as well as an overview of the different measurement methods.

11.51 Following an exchange of views, the Sub-Committee agreed that it was necessary to request clearer instructions from MEPC on how the matter of Black Carbon should be addressed.

11.52 Therefore, the Sub-Committee invited Member Governments and international organizations to submit documents containing concrete proposals to MEPC, to enable further consideration of the matter, including development of a definition of Black Carbon.

Review provision for NO_x Tier III limit

11.53 The Sub-Committee recalled the requirement under regulation 13.10 of MARPOL Annex VI that, beginning in 2012 and completed no later than 2013, the Organization shall review the status of the technological developments to implement the Tier III NO_x emissions standards set forth in paragraph 5.1.1 of regulation 13 of MARPOL Annex VI and shall, if proven necessary, adjust the time periods (effective date) set forth in that subparagraph.

11.54 The Sub-Committee, in order to progress the review process, agreed to request the Secretariat to develop a short document outlining the requirements of the review to be submitted to MEPC 62 under its agenda item on "Prevention of air pollution from ships", and also invited Member Governments and international organizations to submit relevant information.

Establishment of the drafting group

11.55 The Sub-Committee agreed to establish the Drafting Group on Matters Related to MARPOL Annex VI and the NO_x Technical Code and instructed it, taking into account the decisions taken and comments made in plenary, to:

- .1 review and finalize the text of the draft Guidelines addressing additional aspects of the NO_x Technical Code 2008 with regard to particular requirements for marine diesel engines fitted with selective catalytic reduction (SCR) systems, using annex 1 to document BLG 15/11 as base document, and in doing so and to ensure consistency, develop draft amendments to the NTC 2008 relating to certification scheme B and develop any consequential amendments to the NTC 2008, if necessary; and
- .2 review and finalize the text of the draft guidelines for the provision of Annex VI reception facilities, using annex 2 to document BLG 15/11 as base document.

Report of the drafting group

11.56 Having considered the report of the drafting group (BLG 15/WP.6), the Sub-Committee approved it in general and took actions as indicated hereunder.

Draft amendments to the NO_x Technical Code 2008

11.57 The Sub-Committee agreed to the draft amendments to the NO_x Technical Code 2008, as set out in annex 7, for submission to MEPC 62 for approval.

SCR Guidelines

11.58 The Sub-Committee noted that the group could not reach a consensus on whether to retain or delete paragraph 7.7 of the draft Guidelines addressing additional aspects to the NO_x Technical Code 2008 with regard to particular requirements related to marine diesel engines fitted with selective catalytic reduction (SCR) systems. After some discussion, the Sub-Committee agreed to invite MEPC 62 to decide whether paragraph 7.7 should be retained or deleted.

11.59 The Sub-Committee also noted the view of the drafting group on deletion of the section on periodical survey procedure from the draft Guidelines, as the intent of the second part of the deleted section could be included in paragraph 2.3.6 of the NO_x Technical Code 2008 as a possible amendment. In this respect, the United States expressed its intention to submit to MEPC 62 proposed draft amendments to the NO_x Technical Code 2008 to require an adequate monitoring system in order to document the use of the NO_x reducing device when a ship is operating in a NO_x Emission Control Area.

11.60 The Sub-Committee agreed to the draft MEPC resolution on Guidelines addressing additional aspects to the NO_x Technical Code 2008 with regard to particular requirements related to marine diesel engines fitted with selective catalytic reduction (SCR) systems, as set out in annex 8, for submission to MEPC 62 for adoption.

Guidelines for reception facilities under MARPOL Annex VI

11.61 The Sub-Committee agreed to the draft MEPC resolution on Guidelines for reception facilities under MARPOL Annex VI, as set out in annex 9, for submission to MEPC 62 for adoption.

12 DEVELOPMENT OF A CODE FOR THE TRANSPORT AND HANDLING OF LIMITED AMOUNTS OF HAZARDOUS AND NOXIOUS LIQUID SUBSTANCES IN BULK IN OFFSHORE SUPPORT VESSELS

12.1 The Sub-Committee recalled that MEPC 60 had approved an unplanned output on "Development of a Code for the transport and handling of limited amounts of hazardous and noxious liquid substances in bulk in offshore support vessels", for inclusion in the biennial agenda of the Sub-Committee, with a target completion year of 2012.

12.2 The Sub-Committee had the following documents for its consideration:

- .1 BLG 15/12 (Denmark), containing the draft revised Guidelines for the transport and handling of hazardous and noxious liquid substances in bulk in offshore support vessels, based on resolution A.673(16) (referred to as OSV Chemical Code) for further consideration;
- .2 BLG 15/12/1 (Vanuatu), proposing that the application of the IBC Code to offshore support vessels needs to reflect the character of the needs of the offshore energy industry, more in line with the previous concept of resolution A.673(16) and its original intent;
- .3 BLG 15/12/2 (Vanuatu), containing the report of the Cross-industry Working Group for updating resolution A.673(16);
- .4 BLG 15/12/3 (Vanuatu), providing comments on document BLG 15/12 regarding the application of the United Kingdom's national requirements for back loading of used muds to OSVs from drilling facilities;
- .5 BLG 15/12/4 (Vanuatu), providing comments on offshore support vessel design characteristics in comparison to tankers for the purposes of an assessment of tank capacity concerns;
- .6 BLG 15/12/5 (Vanuatu), providing comments on cargo separation on Offshore Support Vessels in resolution A.673(16) compared to the IBC Code;
- .7 BLG 15/12/6 (United States), providing comments on document BLG 15/12 and proposing that additional technical advice be requested from other Sub-Committees, as appropriate; and
- .8 BLG 15/12/7 (Norway), providing comments on document BLG 15/12 regarding the development of a code for OSVs that carry hazardous and noxious liquid substances in limited quantities.

12.3 In considering the above documents, the Sub-Committee noted, *inter alia*, the following views expressed during the discussion:

- .1 that the draft OSV Chemical Code, as contained in the annex to document BLG 15/12 (Denmark), was a good starting point for further development since it would result in a single certification scheme, reduce the number of exemptions and exceptions and intended to provide a clear definition of offshore support vessel and provided a clear cargo list;

- .2 that the basic philosophy and original intent of the Guidelines for the transport and handling of hazardous and noxious liquid substances in bulk in offshore support vessels, as adopted by resolution A.673(16), should be retained and the new Code should take into account the complex and continued evolution of the offshore industry as well as the unique design features and service characteristics of these vessels;
- .3 that blanket application of the IBC Code requirements to the offshore support vessels would unnecessarily restrict OSV design, innovation and normal operation and careful consideration should be given when developing guidance on aspects related to ship survival capability, fire fighting, cargo tank venting, cargo areas and capacities and the products to be carried;
- .4 that further clarification is needed in respect of the application and scope of the new Code, the recommendatory nature of the Code, the responsibility of the master of offshore support vessels as well as the linkage and consistency with other IMO instruments; and
- .5 that advice should be sought from other sub-committees, when necessary, during the development of the new OSV Chemical Code.

12.4 Having noted the intention of several Member Governments to work intersessionally and submit their findings and recommendations to its next session, the Sub-Committee agreed to defer the consideration of how best to proceed with the development of the draft OSV Chemical Code until BLG 16.

13 AMENDMENTS TO SOLAS TO MANDATE ENCLOSED SPACE ENTRY AND RESCUE DRILLS

General

13.1 The Sub-Committee recalled that MSC 87, following consideration of documents MSC 87/24/3 (Bahamas, Vanuatu, OCIMF and IACS) and MSC 87/24/15 (Chile, Cyprus, Islamic Republic of Iran, Italy, Netherlands, Panama and IPTA), proposing amendments to SOLAS to mandate enclosed space entry and rescue drills to ensure that seafarers who enter such spaces are familiar with the precautions to be taken prior to entry and in the event of an accident, agreed to include, in the BLG and DSC Sub-Committees' biennial agendas and the provisional agendas for BLG 15 and DSC 15, an unplanned output on "Amendments to SOLAS to mandate enclosed space entry and rescue drills", with a target completion year of 2012, assigning the DSC Sub-Committee as the coordinating organ.

Outcome of DSC 15

13.2 The Sub-Committee, in considering the outcome of DSC 15 (BLG 15/13), noted that DSC 15, having considered document DSC 15/17 (Bahamas, Chile, the Islamic Republic of Iran, Vanuatu, IACS and OCIMF), proposing amendments to SOLAS to mandate enclosed space entry and rescue drills, noted that the majority of delegations who spoke were of the view that the issuance of guidance (e.g., resolution A.864(20), company policies, etc.) had not achieved the desired effect with regard to ensuring the proper knowledge, training and understanding of the dangers of entering enclosed spaces and, therefore, the only practical approach to reduce the number of fatalities was to have SOLAS mandated drills so that seafarers are familiarized with the precautions to be taken prior to entry into enclosed spaces as well as the effective rescue strategies in the event of an accident.

13.3 The Sub-Committee further noted that other delegations at DSC 15 expressed the view that the SOLAS Convention was not the appropriate instrument to address this important issue, bearing in mind that such fatalities are a failure of the safety management system, and proposed that this matter would be better addressed in the context of the STCW Convention and/or the ISM Code, as appropriate.

13.4 In this context, DSC 15, having considered the views expressed by the Working Group on Revision of the Recommendations for Entering Enclosed Spaces Aboard Ships, noted that consensus on a way forward could not be reached due to time constraints and decided to invite Member Governments and international organizations to submit comments and proposals on this issue to DSC 16. In addition, DSC 15 invited the BLG Sub-Committee to consider document DSC 15/17 as it contained issues that also fall within the purview of the BLG Sub-Committee, with a view to advising DSC 16 of its outcome, taking into account that a working group will be established on this matter at DSC 16.

Consideration of whether mandatory requirements should be developed

13.5 The Sub-Committee noted that the objective of the proposed drills (DSC 15/17) is to ensure that seafarers who may be expected to, or decide to, enter enclosed spaces are familiarized with the precautions to be taken prior to entry, and to ensure that effective rescue strategies are available in the event of an accident.

13.6 In considering the above proposal, some delegations expressed the view that the SOLAS Convention was not the appropriate instrument to address this important issue, bearing in mind that such fatalities are a failure of the safety management system, and proposed that this matter would be better addressed in the context of the ISM Code.

13.7 The delegation of the Cook Islands reiterated the view it expressed at MSC 87 that, while basic safety knowledge has been included in the amendments to the STCW Convention and Code, training should be provided accordingly, supplemented by onboard drills, rather than the other way around, without which the drills proposed by the Bahamas would not have the desired effect.

3.8 Notwithstanding the above views, the Sub-Committee noted that the majority of delegations who spoke were of the view that the most practicable way to reduce the number of fatalities was to have SOLAS mandated drills so that seafarers who may be expected to enter enclosed spaces are familiarized with the precautions to be taken prior to entry and the effective rescue strategies in the event of an accident, taking into account that the SOLAS Convention requires drills for fire-fighting and life-saving operations and that past IMO initiatives in this regard had not achieved a reduction in the number of fatalities.

13.9 The Sub-Committee, after an extensive discussion on this important issue, encouraged Member Governments and international organizations to submit comments and proposals to DSC 16, taking into account that the DSC Sub-Committee, which is the coordinator of this output, will establish a working group at its next session to consider this matter in depth. In this connection, the Sub-Committee also invited Member Governments and international organizations to submit comments and proposals to BLG 16, which should take into account the outcome of DSC 16 and focus on issues that specifically fall under the purview of this Sub-Committee.

14 REVISION OF THE RECOMMENDATIONS FOR ENTERING ENCLOSED SPACES ABOARD SHIPS

General

14.1 The Sub-Committee recalled that MSC 85, having considered the justification prepared by DSC 13 to review and revise the specific provisions of the Recommendations for entering enclosed spaces aboard ships (resolution A.864(20)), agreed to include a new item in the work programmes of the BLG, DSC, FP and STW Sub-Committees, assigning the DSC Sub-Committee as the coordinator.

14.2 The Sub-Committee also recalled that BLG 14 had not proposed any amendments to the Recommendations at that stage. However, recognizing the importance of the issue, BLG 14 welcomed further work on areas where it has special expertise, if such needs were identified by the Committee. Subsequently, Member Governments and international organizations were encouraged to take part in the work of the DSC Correspondence Group established by DSC 14.

Outcome of FP 54

14.3 The Sub-Committee noted that FP 54 (BLG 15/14, paragraphs 2 to 8), having had an extensive discussion on the documents submitted to the session, noted the areas of general agreement, in particular, that the vast majority of those who spoke on the issue agreed that:

- .1 only one set of general recommendations should be developed by IMO to provide guidance to the industry on the risks associated with entering enclosed spaces aboard ships;
- .2 the provisions of the ISM Code should be strengthened to promote awareness regarding the need to follow established safety procedures for enclosed space entry and rescue; and
- .3 some proposals contained in document FP 54/17/1 (IPTA), proposing the development of guidelines for tank entry on chemical tankers, should be considered in the context of revision of the Recommendations.

14.4 In this context, the Sub-Committee noted that FP 54 had expressed the view that the draft Guidelines annexed to document FP 54/17/1 should be considered by the DSC Sub-Committee in light of the work on the revision of the resolution A.864(20), taking into account its applicability to all tankers. In particular, FP 54 agreed that section 2 (Use of nitrogen) of the aforementioned proposed guidance should be specifically considered by DSC 15, with a view to including relevant provisions in the revised Recommendations, and encouraged Member Governments and international organizations to take part in the DSC Correspondence Group established on the matter.

14.5 The Sub-Committee further noted that FP 54, having recognized that entry into the tanks of chemical tankers needs specific attention and that the expertise on tanker-related issues lies within the BLG Sub-Committee, and that it may be beneficial if the draft guidance contained in the annex to document FP 54/17/1 were also brought to the attention of that Sub-Committee for its expert consideration, taking into account its applicability to all tankers, agreed to refer the aforementioned document to BLG 15 for consideration.

Outcome of MSC 87

14.6 In the context of the outcome of FP 54 (BLG 15/14, paragraphs 9 to 12), the Sub-Committee noted that MSC 87, in considering the views expressed by the delegations of the Bahamas and Cook Islands and the Chairman of the DSC Sub-Committee, on whether to refer document FP 54/17/1 to BLG 15, had instructed DSC 15 to forward its outcome to STW 42, BLG 15 and FP 55 so that their expert views can be considered at MSC 89 and A 27, as appropriate, so that the work on the revision of the Recommendations could be completed at MSC 89, for subsequent adoption by the next Assembly.

Outcome of DSC 15

14.7 The Sub-Committee noted that DSC 15 (BLG 15/14, paragraphs 14 to 20), having considered the report of the Correspondence Group on Recommendations for Entering Enclosed Spaces Aboard Ships (DSC 15/10/1), had agreed that two sets of guidance should be prepared as follows:

- .1 a generic set of recommendations dealing with hazards associated with entry into enclosed spaces on all ships; and
- .2 a set of guidelines dealing specifically with entry into cargo spaces protected by inert gas systems on tankers,

and noted that the development of the former set of recommendations (paragraph 14.7.1) fell under its purview while the development of the latter (paragraph 14.7.2) fell under the purview of the BLG Sub-Committee.

14.8 DSC 15 had subsequently instructed the relevant working group to extract the draft provisions related to cargo spaces protected by inert gas systems on tankers, as appropriate, from the generic Recommendations set out in the annex to document DSC 15/10/1. Having considered the aforementioned working group's report (DSC 15/WP.4), DSC 15 noted that a new section 10.4 was added to the draft revised Recommendations to address concerns associated with the use of nitrogen as an inerting gas on board all ship types. In this context, DSC 15 agreed to refer section 10.4 of the draft revised Recommendations and document FP 54/17/1, containing draft Guidelines for tank entry on chemical tankers, to BLG 15, for its consideration on whether separate guidelines should be developed for cargo space entry on tankers using nitrogen as the inerting medium.

14.9 In light of the aforementioned decisions, the Sub-Committee noted that DSC 15 had agreed to the draft Revised Recommendations for entering enclosed spaces aboard ships and the associated draft Assembly resolution, as set out in annex 6 to document DSC 15/18, for submission to MSC 89 for approval, with a view to subsequent adoption by A 27.

Development of separate guidelines for tankers using nitrogen as an inerting medium

14.10 Having considered the outcomes of FP 54 and DSC 15 on whether a separate set of guidelines for tankers using nitrogen as an inerting medium should be developed (see paragraphs 14.3.1 and 14.8), the Sub-Committee agreed to prepare draft Guidelines on tank entry for tankers using nitrogen as an inerting medium, based on document FP 54/17/1, as modified by document BLG 15/14/1 (Bahamas and the Cook Islands), with a view to dissemination via an MSC circular.

Establishment of the drafting group

14.11 Having considered the above issues, the Sub-Committee established the Drafting Group on Revision of the Recommendations for Entering Enclosed Spaces Aboard Ships and instructed it, bearing in mind the relevant decisions taken at DSC 15 (DSC 15/18, section 10) in regard to the preparation of the Revised Recommendations for entering enclosed spaces aboard ships and taking into account the comments and decisions made in plenary, to:

- .1 prepare draft Guidelines on tank entry for tankers using nitrogen as an inerting medium, based on document FP 54/17/1, as modified by document BLG 15/14/1, and the associated MSC circular, for consideration by the Sub-Committee for submission to MSC 89 for approval; and
- .2 propose consequential modifications, if appropriate, to section 10.4 of the draft Revised Recommendations for entering enclosed spaces aboard ships (DSC 15/18, annex 6).

Report of the drafting group

14.12 Having considered the report of the drafting group (BLG 15/WP.7), the Sub-Committee approved it in general and took action as outlined hereunder.

Draft Guidelines on tank entry for tankers using nitrogen as an inerting medium

14.13 In considering the draft Guidelines on tank entry for tankers using nitrogen as an inerting medium prepared by the group, the delegation of Argentina expressed concern that the draft Guidelines had duplicated a number of the provisions contained in the draft Revised Recommendation prepared by DSC 15 and, therefore, they informed the Sub-Committee that they intended to analyse, in detail, both of the aforementioned draft instruments and, if deemed appropriate, they would submit their comments to MSC 89 on this matter. In this connection, the delegation of the Marshall Islands, having expressed its concern in the drafting of the guidelines, advised that it may submit its comments to MSC 89.

14.14 Having recognized the support by a significant majority, the Sub-Committee agreed to the draft MSC circular on Guidelines on tank entry for tankers using nitrogen as an inerting medium, set out in annex 10, for approval by MSC 89.

Review of the draft Revised Recommendations for entering enclosed spaces aboard ships prepared by DSC 15

14.15 In light of the above decision (see paragraph 14.14), the Sub-Committee agreed to the consequential modification to section 10.4 of the draft Revised Recommendations for entering enclosed spaces aboard ships (DSC 15/18, annex 6), as set out in annex 11, for submission to MSC 89 for consideration in conjunction with the approval of the draft Revised Recommendations.

Completion of the work on this output

14.16 The Committee was invited to note that the work on this output had been completed.

15 REVIEW OF PROPOSED AMENDMENTS TO CHAPTER 14 OF THE FSS CODE RELATED TO SHIPS CARRYING LIQUID SUBSTANCES

General

15.1 The Sub-Committee recalled that BLG 14, in considering the draft amendments to chapter 14 of the FSS Code prepared by the FP Sub-Committee, expressed the view that the aforementioned amendments regarding fixed deck foam systems could imply a new carriage requirement for vessels carrying substances listed in chapters 17 and 18 of the IBC Code and invited MSC 87 to approve an unplanned output in the biennial agenda of the Sub-Committee with a target completion year of 2011, so that BLG 15 could further consider the matter in detail and advise FP 55 accordingly.

15.2 In view of the above, BLG 14 agreed to invite the FP Sub-Committee to hold in abeyance the inclusion of amendments relating to the IBC Code in the proposed amendments to chapter 14 of the FSS Code and requested FP 54 to supply relevant information on the testing of high flashpoint chemicals with regard to foam application rates.

Outcome of FP 54 and MSC 87

15.3 The Sub-Committee noted that FP 54 (BLG 15/15) had decided, as requested by BLG 14, to hold the proposed amendments to chapter 14 of the FSS Code in abeyance pending the advice of the BLG Sub-Committee and the relevant decision by MSC 87 on the matter. In the meantime, FP 54 invited Member Governments and international organizations to supply relevant information regarding the testing of high flash-point chemicals with regard to foam application rates.

15.4 Notwithstanding the above, the Sub-Committee noted that FP 54, having noted the views of its Working Group on Performance Testing and Approval Standards for Fire Safety Systems, which had considered the comments from BLG 14, endorsed the view that the concerns expressed in paragraph 15.1 above did not conform to its understanding of SOLAS chapter II-2 nor was there any intention to establish new carriage requirements for chemicals covered by the IBC Code.

15.5 The Sub-Committee also noted the aforementioned working group's opinion that SOLAS regulation II-2/1.6.1 applied to crude oil and petroleum products with a flashpoint less than 60°C, as stated in the last sentence of the above regulation (i.e. "other liquid products having similar hazard"). The "other products" referred to are deemed to include IBC Code chapter 18 cargoes with a flashpoint less than 60°C. In their view, chapter 17 cargoes with a flashpoint less than 60°C must comply with the IBC Code. The Sub-Committee also noted the working group's opinion that any crude oil or petroleum products or chapter 18 cargoes with a flash-point less than 60°C are already required by SOLAS to have a deck foam system complying with chapter 14 of the FSS Code, and that chapters 17 and 18 cargoes with a flashpoint more than 60°C may be required to have a deck foam system by SOLAS regulation II-2/1.6.4.

Consideration of proposed amendments to chapter 14 of the FSS Code

15.6 Taking into account the views expressed at FP 54, the Sub-Committee considered document BLG 15/15/1 (United States), commenting on document BLG 15/15 and proposing revisions to the draft amendments to chapter 14 of the FSS Code developed by FP 53 (BLG 14/16/1), and noted that the United States, after careful consideration of SOLAS regulations II-2/1.6.1 to II-2/1.6.4 and chapter 11 of the IBC Code, was of the view that deck foam system requirements should be interpreted as follows:

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- .1 chapter 17 cargoes with a flash-point less than 60°C must comply with the IBC Code, chapter 11 (IBC Code, paragraph 11.1.1);
 - .2 chapter 17 cargoes with a flash-point of 60°C and above must comply with the FSS Code, chapter 14 (IBC Code, paragraph 11.1.3 and SOLAS regulation II-2/1.6.4);
 - .3 chapter 18 cargoes with a flash-point less than 60°C must comply with the FSS Code, chapter 14 (SOLAS regulation II-2/1.6.1); and
 - .4 chapter 18 cargoes with a flash-point of 60°C and above constitute a low fire risk and do not require a fixed foam-extinguishing system (SOLAS regulation II-2/1.6.3),

and that they had prepared suitable amendments to draft paragraphs 2.2.1.1 and 2.2.1.2 of chapter 14 of the FSS Code, for consideration by the Sub-Committee.

15.7 Having considered the above proposal, the Sub-Committee agreed to the draft amendments to chapter 14 of the FSS Code, as set out in annex 12, and requested the Secretariat to forward them to FP 55 for consideration and action, as appropriate.

Completion of the work on this output

15.8 The Committee was invited to note that the work on this output had been completed.

16 BIENNIAL AGENDA AND PROVISIONAL AGENDA FOR BLG 16

General

16.1 The Sub-Committee recalled that, at its last session, it was informed that the Assembly had requested the Committees to review and revise, during the current biennium, their respective Guidelines on the organization and method of work (Committees' Guidelines), with a view to bringing them in line with the Council's Guidelines on the application of the Strategic Plan and the High-level Action Plan, as adopted by resolution A.1013(26).

16.2 The Sub-Committee also recalled that, in pursuance of the above request, MSC 87 had prepared a draft revision of the Committee's Guidelines, which were endorsed by MEPC 61, taking into account the provisions of the Migration Plan prepared by the Council. MSC 88, having agreed to additional revisions, had requested the Secretariat to prepare a consolidated version of the draft revised Guidelines, for consideration by MSC 89 with a view to approval.

16.3 The Sub-Committee further recalled that, to facilitate the transition, MSC 87 had instructed the subsidiary bodies to prepare their respective biennial agendas for the next biennium at their forthcoming sessions, in accordance with the draft revised Guidelines, taking into account that:

- .1 outputs selected for the biennial agenda should be phrased in SMART (specific, measurable, achievable, realistic and time-bound) terms; and
- .2 where the target completion year for a specific output goes beyond the 2012-2013 biennium, an interim output should be placed in the biennial agenda with a target completion year of 2012 or 2013, as appropriate, and a related output should be placed in the Committee's post-biennial agenda with the anticipated completion year,

and requested the Secretariat, in consultation with the Chairman, to prepare the initial proposals for consideration by the sub-committees accordingly.

Proposals for the biennial agenda for 2012-2013 and provisional agenda for BLG 16

16.4 Taking into account the progress made during this session and the decisions of MSC 87, MEPC 61 and MSC 88, the Sub-Committee prepared its draft biennial agenda for the 2012-2013 biennium in SMART terms, including proposed outputs for the Committee's post-biennial agenda that fall under the purview of the Sub-Committee, and the provisional agenda for BLG 16 (BLG 15/WP.2), based on the biennial agenda approved by MSC 88 (BLG 15/2/2), as set out in annexes 13 and 14, respectively, for consideration by MSC 89 and MEPC 62.

Arrangements for the next session

16.5 The Sub-Committee agreed to establish at its next session working groups on the following subjects:

- .1 evaluation of safety and pollution hazards of chemicals and preparation of consequential amendments;
- .2 development of guidelines and other documents for uniform implementation of the 2004 BWM Convention and international measures for minimizing the transfer of aquatic species through biofouling of ships; and
- .3 International Code of safety for ships using gases or other low flashpoint fuels.

16.6 The Sub-Committee agreed to establish at its next session drafting groups on the following subjects:

- .1 review of relevant non-mandatory instruments as a consequence of the amended MARPOL Annex VI and the NO_x Technical Code; and
- .2 development of the revised IGC Code.

16.7 The Sub-Committee established the following correspondence groups, which are due to report to BLG 16:

- .1 Development of a BWM Circular on Ballast Water Sampling and Analysis;
- .2 Development of the IGF and IGC Codes; and
- .3 Review of Relevant Non-mandatory Instruments as a Consequence of the amended MARPOL Annex VI and the NO_x Technical Code.

Status of planned outputs for the 2010-2011 biennium

16.8 The Sub-Committee prepared the report on the status of planned outputs of the High-level Action Plan of the Organization and priorities for the 2010-2011 biennium relevant to the Sub-Committee, as set out in annex 15, and invited the Committees to note the status.

Intersessional meetings

16.9 The Sub-Committee, having recalled its respective decision under agenda item 3 (see paragraph 3.15.13), invited MSC 89 and MEPC 62 to approve the holding of an intersessional meeting of the ESPH Working Group in 2012.

Date of the next session

16.10 The Sub-Committee noted that the sixteenth session of the Sub-Committee had been tentatively scheduled to take place from 30 January to 3 February 2012.

Urgent matters to be considered by MEPC 63 and MSC 90

16.11 The Sub-Committee noted that, due to the close proximity between BLG 16 and MEPC 63 and MSC 90, the Committees, in accordance with the Guidelines on the organization and method of work, will consider only urgent matters emanating from BLG 16, with the remainder actions being considered by MEPC 64 and MSC 91. Consequently, the Sub-Committee agreed that the following urgent matters emanating from BLG 16 should be considered by MEPC 63 and MSC 90, as appropriate (see paragraphs 3.15.5 and 5.33):

- .1 Evaluation of safety and pollution hazards of chemicals and preparation of consequential; and
- .2 Development of guidelines and other documents for uniform implementation of the 2004 BWM Convention.

17 ELECTION OF CHAIRMAN AND VICE-CHAIRMAN FOR 2012

17.1 The Sub-Committee, in accordance with the Rules of Procedure of the Maritime Safety Committee and the Marine Environment Protection Committee, unanimously re-elected Mr. S. Oftedal (Norway) as Chairman, and Mr. R. Zhang (China) as Vice-Chairman, both for 2012.

18 ANY OTHER BUSINESS

Transportation of formic acid

18.1 The Sub-Committee agreed to consider document BLG 15/18 (Italy), seeking clarification on the transportation of formic acid with less than 85% acid by mass, under agenda item 3 (Evaluation of safety and pollution hazards of chemicals and preparation of consequential amendments) (see paragraph 3.9).

Black Carbon

18.2 The Sub-Committee agreed to consider documents BLG 15/INF.5 and BLG 15/INF.8 (Clean Shipping Coalition), providing information on Black Carbon emissions from international shipping activity in the Arctic, under agenda item 11 (Review of relevant non-mandatory instruments as a consequence of the amended MARPOL Annex VI and the NO_x Technical Code) (see paragraph 11.49).

18.3 In this connection, the Sub-Committee also agreed to consider document BLG 15/WP.8 (Secretariat), providing background information and an outline of possible approaches to address the issue of Black Carbon, as well as overview of the different measurement methods, under agenda item 11 (Review of relevant non-mandatory instruments as a consequence of the amended MARPOL Annex VI and the NO_x Technical Code) (see paragraph 11.50).

Expressions of appreciation

18.4 The Sub-Committee expressed appreciation to the following delegates and members of the Secretariat, who had recently relinquished their duties, retired or were transferred to other duties, for their invaluable contribution to its work and wished them a long and happy retirement or, as the case might be, every success in their new duties:

- Mr. John Bainbridge (ITF) (on retirement);
- Mr. Javier Llorens (Secretariat) (on retirement);
- Mr. Miguel Palomares (Secretariat) (on retirement);
- Mr. Alexander Petrov (Secretariat) (on retirement);
- Mr. Malamine Thiam (Secretariat) (on retirement);
- Dr. Peter Swift (INTERTANKO) (on retirement);
- Mr. Santiago Villalba (Argentina) (on transfer).

19 ACTION REQUESTED OF THE COMMITTEES

19.1 The Maritime Safety Committee, at its eighty-ninth session, is invited to:

- .1 endorse, subject to MEPC 62's concurrent decision, the decisions taken by the Sub-Committee regarding the outcome of ESPH 16 (paragraph 3.2);
- .2 endorse, subject to MEPC 62's concurrent decision, the issuance of BLG.1/Circ.31 on Decisions on the categorization and classification of products (paragraph 3.15.1);
- .3 approve, subject to MEPC 62's concurrent decision, the timeline for the preparation of amendments to chapters 17, 18 and 19 of the IBC Code (paragraph 3.15.5);
- .4 endorse, subject to MEPC 62's concurrent decision, the issuance of BLG.1/Circ.32 on Carriage conditions and special requirements assigned for Mixed C4, which will be included as a new entry into the IGC Code (paragraph 3.15.8);
- .5 approve the draft amendments to SOLAS chapter VI, regarding the prohibition of the blending of bulk liquid cargoes during the sea voyage, with a view to subsequent adoption (paragraph 4.13.4 and annex 3);
- .6 approve the draft MSC circular on Guidelines on tank entry for tankers using nitrogen as an inerting medium (paragraph 14.14 and annex 10);
- .7 consider the consequential modification to section 10.4 of the draft Revised Recommendations for entering enclosed spaces aboard ships, in conjunction with the approval of the aforementioned Revised Recommendations for subsequent adoption by the Assembly (paragraph 14.15 and annex 11);

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- .8 note that the draft amendments to chapter 14 of the FSS Code have been forwarded to FP 55 for consideration and action, as appropriate (paragraph 15.7 and annex 12);
 - .9 approve, subject to MEPC 62's concurrent decision, the biennial agenda of the Sub-Committee for the 2012-2013 biennium and the outputs to be placed on the Committee's post-biennial agenda which are under the purview of the Sub-Committee (paragraph 16.4 and annex 13);
 - .10 approve, subject to MEPC 62's concurrent decision, the draft provisional agenda for BLG 16 (paragraph 16.4 and annex 14);
 - .11 note the report on the status of the Sub-Committee's planned outputs in the High-level Action Plan for the current biennium (paragraph 16.8 and annex 15);
 - .12 approve, subject to MEPC 62's concurrent decision, the holding of an intersessional meeting of the ESPH Working Group in 2012 (paragraph 16.9);
 - .13 agree on the urgent matter emanating from BLG 16 to be reported to MSC 90 (paragraph 16.11.1); and
 - .14 approve the report in general.

19.2 The Marine Environment Protection Committee, at its sixty-second session, is invited to:

- .1 endorse, subject to MSC 89's concurrent decision, the decisions taken by the Sub-Committee regarding the outcome of ESPH 16 (paragraph 3.2);
- .2 endorse, subject to MSC 89's concurrent decision, the issuance of BLG.1/Circ.31 on Decisions on the categorization and classification of products (paragraph 3.15.1);
- .3 endorse the cargo tank cleaning additives evaluated and found to meet the requirements of regulation 13.5.2 of MARPOL Annex II, for inclusion in the next edition of the MEPC.2/Circular (paragraph 3.15.2 and annex 1);
- .4 endorse the evaluation of the Trade-named mixtures presenting safety hazards, for inclusion in List 3 of the MEPC.2/Circular (paragraph 3.15.4);
- .5 approve, subject to MSC 89's concurrent decision, the timeline for the preparation of amendments to chapters 17, 18 and 19 of the IBC Code (paragraph 3.15.5);
- .6 endorse the Sub-Committee's decision that products with new complete data for column i (electrical equipment) be added to List 1 of the MEPC.2/Circular (paragraph 3.15.6);

- .7 endorse, subject to MSC 89's concurrent decision, the issuance of BLG.1/Circ.32 on Carriage conditions and special requirements assigned for Mixed C4, which will be included as a new entry into the IGC Code (paragraph 3.15.8);
- .8 endorse the revision of the carriage requirements of Formic acid, for inclusion in List 1 of the MEPC.2/Circular (paragraph 3.15.9);
- .9 approve the draft MEPC circular on Guidelines for the carriage of blends of petroleum oil and bio-fuels (paragraph 4.13.2 and annex 2);
- .10 agree that the current interim guidance on the carriage of blends of petroleum oil and bio-fuels should remain in effect until 1 September 2011, if the draft Guidelines for the carriage of blends of petroleum oil and bio-fuels are approved at MEPC 62 (paragraph 4.6);
- .11 endorse the inclusion of a new annex for recognized bio-fuels in the MEPC.2/Circular and the addition of generic carriage requirements for bio-fuel/petroleum oil blends into List 1 (paragraph 4.13.3);
- .12 note that the Sub-Committee prepared a draft amendment to SOLAS chapter VI for the prohibition of the blending of bulk liquid cargoes during the sea voyage, for consideration and subsequent adoption by the MSC (paragraph 4.13.4 and annex 7);
- .13 delete the item on Application of the requirements for the carriage of bio-fuels and bio-fuel blends from the agenda of BLG as the work has been completed (paragraph 4.15);
- .14 adopt the draft MEPC resolution on Procedure for approving other methods of ballast water management in accordance with regulation B-3.7 of the BWM Convention (paragraph 5.25 and annex 4);
- .15 approve the draft MEPC circular on Guidance on Scaling of ballast water management systems (paragraph 5.27 and annex 5);
- .16 note the progress made on the development of a draft BWM circular on Ballast water sampling and analysis (paragraphs 5.31 to 5.33);
- .17 adopt the draft MEPC resolution on Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species (paragraph 9.10.1 and annex 6);
- .18 note the Sub-Committee's view that more information and data was required to enable appropriate consideration on matters related to the revised specification of marine fuels (ISO 8217:2010), limit of hydrogen sulphide (H₂S), and a possible new mechanism for quality control of bunkers; and that the consideration of these matters had made clear that there is no obvious way in which the Sub-Committee may take this forward (paragraphs 11.32 and 11.33);

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- .19 note that the Sub-Committee established the correspondence group to progress the development of the remaining guidelines and guidance documents as a consequence of the amended MARPOL Annex VI and the NO_x Technical Code 2008 (paragraph 11.46);
 - .20 provide clearer instructions to the Sub-Committee on how the matter of Black Carbon should be addressed (paragraph 11.51);
 - .21 note that, in the context of review of the status of the technological developments to implement the Tier III NO_x emissions standards (MARPOL Annex VI, regulation 13.10), the Secretariat was requested to prepare a document outlining the requirements of the review, for submission to MEPC 62 for consideration (paragraph 11.54);
 - .22 approve the draft amendments to the NO_x Technical Code 2008 with a view to subsequent adoption (paragraph 11.57 and annex 7);
 - .23 adopt the draft MEPC resolution on Guidelines addressing additional aspects to the NO_x Technical Code 2008 with regard to particular requirements related to marine diesel engines fitted with selective catalytic reduction (SCR) systems, taking into account the request for the Committee to decide on whether to retain or delete paragraph 7.7 regarding the confirmation test for parent engine system of the group (paragraphs 11.58 and 11.60 and annex 8);
 - .24 adopt the draft MEPC resolution on Guidelines for reception facilities under MARPOL Annex VI (paragraph 11.61 and annex 9);
 - .25 approve, subject to MSC 89's concurrent decision, the biennial agenda of the Sub-Committee for the 2012-2013 biennium and the outputs to be placed on the Committee's post-biennial agenda which are under the purview of the Sub-Committee (paragraph 16.4 and annex 13);
 - .26 approve, subject to MSC 89's concurrent decision, the draft provisional agenda for BLG 16 (paragraph 16.4 and annex 14);
 - .27 note the report on the status of the Sub-Committee's planned outputs in the High-level Action Plan for the current biennium (paragraph 16.8 and annex 15);
 - .28 approve, subject to MSC 89's concurrent decision, the holding of an intersessional meeting of the ESPH Working Group in 2012 (paragraph 16.9);
 - .29 agree on the urgent matters emanating from BLG 16 to be reported to MEPC 62 (paragraph 16.11); and
 - .30 approve the report in general.

ANNEX 1

**CARGO TANK CLEANING ADDITIVES EVALUATED AND FOUND TO MEET THE REQUIREMENTS OF
REGULATION 13.5.2 OF MARPOL ANNEX II FOR INCLUSION IN THE MEPC.2/CIRCULAR¹**

Name of cleaning additive	Name of manufacturer	Reporting Country
ACE 4020 Multi Purpose Detergent, T-Pol	ACE Chemicals International Pte. Ltd	SGP
ACE 7012 Oil & Grease Remover	ACE Chemicals International Pte. Ltd	SGP
ACE 9005 Heavy Duty Alkaline Cleaner	ACE Chemicals International Pte. Ltd	SGP
ACE 9007 Heavy Duty Tank Cleaner A	ACE Chemicals International Pte. Ltd	SGP
ACE 9011 Heavy Duty Cleaner	ACE Chemicals International Pte. Ltd	SGP
ACE 9020 Liquid Rig Wash	ACE Chemicals International Pte. Ltd	SGP
ACE 9026 Hydrocarbon Remover	ACE Chemicals International Pte. Ltd	SGP
ACE 9027 Sodium Hypochlorite 12% Solution	ACE Chemicals International Pte. Ltd	SGP
FALCHEM Bleach Substitute	Enerchem (S) Pte. Ltd	SGP
FALCHEM Buffer Clean, Tank Cleaner	Enerchem (S) Pte. Ltd	SGP
FALCHEM Enerpol, Multi Purpose Detergent	Enerchem (S) Pte. Ltd	SGP
Chemtec-HCK	CHEMTEC Chemicals GmbH	DEU
Coaltar Remover	WVT Industries N.V.	BEL
HD Tank Cleaner	WVT Industries N.V.	BEL
Steam Cleaner 155	WVT Industries N.V.	BEL
Tank Cleaning Cat	WVT Industries N.V.	BEL
Chemalyt 146	Henkel Belgium N.V.	BEL
NA marine	Henkel Belgium N.V.	BEL
Carbin Cleaner	Shanghai Whitecat Special Chemicals Co.Ltd.	CHN
MARISOL GD	Maritech Marine Technologies AB	SWE
MARISOL LC	Maritech Marine Technologies AB	SWE
MARISOL RW	Maritech Marine Technologies AB	SWE

¹ All products evaluated in accordance with MEPC.1/Circ.590.

Name of cleaning additive	Name of manufacturer	Reporting Country
MARISOL TC	Maritech Marine Technologies AB	SWE
MAC Alkid	MASTEC Co. Ltd	JPN
MAC Dual Clean	MASTEC Co. Ltd	JPN
MAC HC-10	MASTEC Co. Ltd	JPN
MAC HC-100	MASTEC Co. Ltd	JPN
MAC HD	MASTEC Co. Ltd	JPN
MAC Prime	MASTEC Co. Ltd	JPN
MAC Safety Alkid	MASTEC Co. Ltd	JPN
MAC Susbright	MASTEC Co. Ltd	JPN
Careclean Passivation Liquid	Marine Care cleaning additives	NLD
Careclean PL-Con	Marine Care cleaning additives	NLD
Green Care HC	Marine Care cleaning additives	NLD
GreenCare Synergy	Marine Care cleaning additives	NLD
Neutral HCF	Star marine Chemicals B.V.	NLD
GP Degreaser	VECOM	NLD
Latex Remover	VECOM	NLD
Multi Cleaner	VECOM	NLD
Resin Stripper	VECOM	NLD
Seaclean Voyage	VECOM	NLD
Steamclean Extra	VECOM	NLD
Tankclean HCF	VECOM	NLD
Aquamarine Aquawash T1080A	Aquamarine Chemicals	GBR
Aquamarine Caustic-Free Cleaner	Aquamarine Chemicals	GBR
Aquamarine Natural Zest T1335A	Aquamarine Chemicals	GBR
Aquamarine Neutral HCF	Aquamarine Chemicals	GBR
Aquamarine Rustremover	Aquamarine Chemicals	GBR
Aquamarine Strong Alkaline Cleaner T1108A	Aquamarine Chemicals	GBR
Aquamarine Tank Cleaner HD	Aquamarine Chemicals	GBR
Alclean	AYT Endustriyel Kimya Sansayi Ltd. STI	TUR
Alclean Safe	AYT Endustriyel Kimya Sansayi Ltd. STI	TUR

Name of cleaning additive	Name of manufacturer	Reporting Country
Alcleaner PBC	AYT Endustriyel Kimya Sanayi Ltd. STI	TUR
Green Enviro	AYT Endustriyel Kimya Sanayi Ltd. STI	TUR
MITE	AYT Endustriyel Kimya Sanayi Ltd. STI	TUR
Natural	AYT Endustriyel Kimya Sanayi Ltd. STI	TUR
Natural HCF	AYT Endustriyel Kimya Sanayi Ltd. STI	TUR
Ready	AYT Endustriyel Kimya Sanayi Ltd. STI	TUR
Rem-25	AYT Endustriyel Kimya Sanayi Ltd. STI	TUR
Tank Shine	AYT Endustriyel Kimya Sanayi Ltd. STI	TUR
Teco Potassium (Potassium Hydroxide)	Teco Chemicals AS – Norway	NOR
Clean Break	UNI Americas LLC	USA
Cold Wash HD	UNI Americas LLC	USA
Ecoclean	UNI Americas LLC	USA
Rust Off	UNI Americas LLC	USA
Seaclean	UNI Americas LLC	USA
Teco Caustic	Teco Chemicals AS – Norway	NOR
Enviro HCF Tank Kleen	Enviro-Tech Specialities, Inc	USA
Enviro Multi Kleen	Enviro-Tech Specialities, Inc	USA
Enviro Rust Kleen	Enviro-Tech Specialities, Inc	USA
Enviro Teepol	Enviro-Tech Specialities, Inc	USA
AMEROID RSR	DREW MARINE	USA
Drew BC	DREW MARINE	USA
Envirocare 480	DREW MARINE	USA
ATLAS 100	Atlas Chemicals, Inc	USA
ATLAS 150	Atlas Chemicals, Inc	USA
ATLAS 202	Atlas Chemicals, Inc	USA
ATLAS A-CHLOR	Atlas Chemicals, Inc	USA
ATLAS AQUA-SOLV	Atlas Chemicals, Inc	USA
ATLAS CD-SEA	Atlas Chemicals, Inc	USA
ATLAS I-A-C	Atlas Chemicals, Inc	USA
ATLAS KRUSHER	Atlas Chemicals, Inc	USA

Name of cleaning additive	Name of manufacturer	Reporting Country
ATLAS MAR-CLEAN	Atlas Chemicals, Inc	USA
ATLAS METAL BRIGHT	Atlas Chemicals, Inc	USA
ATLAS METAL TREAT	Atlas Chemicals, Inc	USA
ATLAS SUPER GREEN	Atlas Chemicals, Inc	USA

ANNEX 2

DRAFT MEPC CIRCULAR

GUIDELINES FOR THE CARRIAGE OF BLENDS OF PETROLEUM OIL AND BIO-FUELS

1 The Marine Environment Protection Committee, at its [sixty-second session (11 to 15 July 2011)], recognizing the need to clarify how bio-fuels subject to MARPOL Annex II, when blended with petroleum oils, subject to Annex I of MARPOL, can be shipped in bulk, approved the Guidelines for the carriage of blends of petroleum oil and bio-fuels.

2 Members Governments and international organizations are invited to bring the annexed Guidelines to the attention of Administrations, recognized organizations, port authorities, shipowners, ship operators and other parties concerned.

ANNEX

GUIDELINES FOR THE CARRIAGE OF BLENDS OF PETROLEUM OIL AND BIO-FUELS

1 APPLICATION

1.1 These guidelines apply to ships when carrying in bulk blends of Petroleum Oil and Bio-Fuels subject to Annex I and Annex II of MARPOL, respectively.

2 SCOPE

2.1 These Guidelines have been developed to clarify how bio-fuels subject to Annex II of MARPOL, when blended with petroleum oils, subject to Annex I of MARPOL, can be shipped in bulk.

3 DEFINITIONS

For the purpose of these guidelines:

3.1 *Bio-fuels* are ethyl alcohol, fatty acid methyl esters (FAME), vegetable oils (triglycerides) and alkanes (C10-C26), linear and branched with a flashpoint of either 60°C or less or more than 60°C, as identified in chapters 17 and 18 of the IBC Code or the MEPC.2/Circular/tripartite agreements. Following the distribution of these guidelines, further bio-fuels identified as falling under the scope of the guidelines, will be recorded in annex 11 of the MEPC.2/Circular which deals with bio-fuel/petroleum oil blends.

3.2 *Bio-fuel blends* are mixtures resulting from the blending of those products identified at 3.1 above with a petroleum oil.

4 CARRIAGE OF BIO-FUEL BLENDS

The carriage provision for bio-fuel blends is based on the volumetric composition of the blends as follows:

4.1 Bio-fuel blends containing 75% or more of petroleum oil

4.1.1 When containing 75% or more of petroleum oil, the bio-fuel blend is subject to Annex I of MARPOL.

4.1.2 When carrying such bio-fuel blends, Oil Discharge Monitoring Equipment (ODME – see resolution MEPC.108(49)) shall be in compliance with regulation 31 of Annex I of MARPOL and should be approved for the mixture being transported.

4.1.3 Until 1 January 2016 bio-fuel blends may be carried when the ship's ODME is not in compliance with paragraph 4.1.2 above provided that tank residues and all tank washings are pumped ashore.

4.1.4 When considering the deck fire-fighting system requirements of SOLAS chapter II-2, regulations 1.6.1 and 1.6.2, when carrying bio-fuel blends containing ethyl alcohol then alcohol resistant foams should be used.

4.2 Bio-fuel blends containing more than 1% but less than 75% of petroleum oil

4.2.1 When containing more than 1% but less than 75% of petroleum oil, the bio-fuel blends are subject to Annex II of MARPOL and should be carried under the following conditions:

a	c	d	e	f	g	h	i'	i''	i'''	j	k	l	n	o
Bio-fuel blends of Diesel/gas oil and FAME (>25% but <99% by volume)	X	S/P	2	2G	Cont	No	-	-	Yes	C	T	ABC	No	15.12, 15.17, 15.19.6
Bio-fuel blends of Diesel/gas oil and Vegetable oil (>25% but <99% by volume)	X	S/P	2	2G	Cont	No	-	-	Yes	C	T	ABC	No	15.12, 15.17, 15.19.6
Bio-fuel blends of Gasoline and Ethyl alcohol (>25% but <99% by volume)	X	S/P	2	2G	Cont	No	T3	IIA	No	C	F-T	AC	No	15.12, 15.17, 15.19.6
Bio-fuel blends of Diesel/gas oil and Alkanes (C10-C26), linear and branched with a flashpoint > 60°C (>25% but <99% by volume)	X	S/P	2	2G	Cont	No	-	-	Yes	C	T	ABC	No	15.12, 15.17, 15.19.6
Bio-fuel blends of Diesel/gas oil and Alkanes (C10-C26), linear and branched with a flashpoint ≤ 60°C (>25% but <99% by volume)	X	S/P	2	2G	Cont	No	T3	IIA	No	C	F-T	ABC	No	15.12, 15.17, 15.19.6

4.2.2 With respect to new bio-fuels identified as falling under the scope of these guidelines, carriage requirements for specific bio-fuel/petroleum oil blends to be shipped as MARPOL Annex II cargoes will be incorporated into List 1 of the MEPC.2/Circular, as appropriate.

4.3 Bio-fuel blends containing 1% or less petroleum oil

4.3.1 When containing 1% or less of petroleum oil, the bio-fuel blends are subject to Annex II of MARPOL.

5 BLENDING OF PETROLEUM OIL AND BIO-FUEL ON BOARD

5.1 Blending on board describes the mixing of two products resulting in one single product (a blended mixture) and reflects only physical mixing as distinct from any chemical processing. Such mixing operations should only be undertaken whilst the ship is within port limits.

5.2 The physical blending on board of petroleum oil and bio-fuels during a sea voyage to create new products is prohibited as indicated in MSC-MEPC.2/Circ.8 Prohibition of Blending MARPOL Cargoes on Board During the Sea Voyage.

6 CERTIFICATION REQUIREMENTS

6.1 The certification for the bio-fuel blend to be shipped should be in compliance with Annex I or Annex II of MARPOL, as appropriate.

ANNEX 3

DRAFT AMENDMENTS TO SOLAS CHAPTER VI

CARRIAGE OF CARGOES

Regulation 5-2

- 1 The following new regulation 5-2 is added after regulation 5-1:

"Regulation 5-2

Prohibition of the blending of bulk liquid cargoes during the sea voyage

1 The physical blending of bulk liquid cargoes during the sea voyage is prohibited. Physical blending refers to the process whereby the ship's cargo pumps and pipelines are used to internally circulate two or more different cargoes with the intent to achieve a cargo with a new product designation. This prohibition does not preclude the master from undertaking cargo transfers for the safety of the ship or protection of the marine environment.

2 The above prohibition does not apply to the blending of products for use in the search and exploitation of sea-bed mineral resources on board ships used to facilitate such operations."

ANNEX 4

DRAFT MEPC RESOLUTION

**PROCEDURE FOR APPROVING OTHER METHODS OF BALLAST WATER
MANAGEMENT IN ACCORDANCE WITH REGULATION B-3.7
OF THE BWM CONVENTION**

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee conferred upon it by the international conventions for the prevention and control of marine pollution,

RECALLING ALSO the adoption by the International Conference on Ballast Water Management for Ships, held at the Organization's Headquarters in 2004, of the International Convention for the Control and Management of Ships' Ballast Water and Sediments (hereinafter "the BWM Convention"),

RECALLING FURTHER that regulation A-2 of the BWM Convention requires that discharge of ballast water shall only be conducted through ballast water management in accordance with the provisions of the Annex to the Convention,

NOTING that regulation B-3.7 of the BWM Convention permits the use of "Other Methods" of ballast water management to achieve at least the same level of protection to the environment, human health, property or resources as described in regulations B-3.1 to B-3.5,

RECOGNIZING that such "Other Methods" should take into account safety considerations relating to the ship and the crew, environmental acceptability, practicality, cost-effectiveness, economics and biological effectiveness and should be approved in principle by the Marine Environment Protection Committee,

HAVING CONSIDERED, at its [sixty-second session], the draft Procedure for approving Other Methods of ballast water management in accordance with regulation B-3.7 of the BWM Convention, proposed by the Sub-Committee on Bulk Liquids and Gases at its fifteenth session,

1. ADOPTS the Procedure for approving Other Methods of ballast water management in accordance with regulation B-3.7 of the BWM Convention, as set out in the annex to the present resolution;
2. INVITES Administrations to apply the annexed Procedure as soon as possible, or when the Convention becomes applicable to them;
3. URGES Member States to bring the annexed Procedure to the attention of shipowners, shipbuilders and manufacturers of ballast water management systems, as well as any other parties concerned; and
4. AGREES to keep the Procedure under review.

ANNEX

PROCEDURE FOR APPROVING OTHER METHODS OF BALLAST WATER MANAGEMENT IN ACCORDANCE WITH REGULATION B-3.7 OF THE BWM CONVENTION

1 INTRODUCTION

1.1 Regulation B-3.7 of the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (the BWM Convention) permits the use of Other Methods of ballast water management to achieve at least the same level of protection to the environment, human health, property or resources as described in regulations B-3.1 to B-3.5, and approved in principle by the MEPC.

1.2 Those developing Other Methods should also take into account: safety considerations relating to the ship and the crew; environmental acceptability (i.e. not causing greater environmental impacts than they solve); practicality (i.e. compatibility with ship design and operations); cost-effectiveness and economics; and biological effectiveness.

1.3 The Procedure for approving Other Methods of ballast water management in accordance with regulation B-3.7 of the BWM Convention (hereafter referred to as "the Procedure"), aims at providing criteria for the evaluation and approval of Other Methods of ballast water management (hereafter referred to as "Other Methods").

1.4 This Procedure has been developed to ensure that these Other Methods provide at least the same level of protection to the environment, human health, property or resources as those methods permitted under regulations B-3.1 to B-3.5.

1.5 Other Methods of ballast water management are to be approved in principle by the Committee prior to approval of an Other Method by the Administration.

1.6 Systems based on an Other Method where Active Substances and Preparations are added to the ballast water, or are generated on board ships by the system, should also be subject to the approval by the Committee in accordance with the Procedure for approval of ballast water management systems that make use of Active Substances (G9).

1.7 All shipboard systems based on an Other Method will also have to gain Type Approval or Prototype Approval, as appropriate, under the Guidelines for approval of ballast water management systems (G8), or Guidelines for approval of prototype ballast water treatment technologies (G10).

1.8 Where an Other Method cannot be type approved due to the nature of the method, the Administration should recommend to the Committee an appropriate method of recognition or certification.

1.9 The environmental impacts of any chemical by-products and/or physical effects formed by an Other Method will also have to be evaluated by the Administration during the approval process, with respect to safety to the environment.

1.10 The Procedure identifies the information to be provided, identifies the responsible parties for providing such information and outlines the approval processes required by the Committee.

1.11 The use of Other Methods of ballast water management should be consistent with the objectives of the Convention – "to prevent, minimize and ultimately eliminate the risks to the environment, human health, property and resources arising from the transfer of harmful aquatic organisms and pathogens through the control and management of ships' ballast water and sediments, as well as to avoid unwanted side effects from that control, and to encourage developments in related knowledge and technology". Depending on the new technology used in the Other Method, verifications for approval could be different from those specified in paragraph 1.7 but keep the same level of protection.

1.12 Other Methods using organisms are not within the scope of this Procedure.

2 PURPOSE

2.1 The Procedure aims to ensure that any Other Methods approved provide an equivalent level of protection to the standards contained in the BWM Convention. The Procedure will be kept under review and updated by the Committee in light of the experience gained during its application and as the state of knowledge and technology may require.

2.2 The purpose of the Procedure is to:

- .1 provide a uniform interpretation and application of the requirements for the approval of Other Methods permitted under regulation B-3.7;
- .2 ensure that Other Methods approved by an Administration are capable of at least achieving equivalence to the level of protection provided by the standards of the BWM Convention with respect to the prevention of the transfer of harmful aquatic organisms and pathogens as required by regulations B-3.1 to B-3.5;
- .3 assist in determining the information necessary for the approval in principle of Other Methods under regulation B-3.7 of the BWM Convention and identify the roles and responsibilities in providing such information;
- .4 assist Administrations in conducting the approval of an Other Method;
- .5 provide guidance to manufacturers, shipowners and other interested parties involved in determining the suitability of an Other Method to meet the requirements of the BWM Convention; and
- .6 provide the approval process used by the Committee.

3 DEFINITIONS

3.1 For the purposes of this Procedure, the definitions in the Convention apply and:

- .1 **Method** means a process developed and designed to reduce the transfer of harmful aquatic organisms through ships' ballast water to meet the requirements specified under regulations B-3.1 to B-3.5 of the BWM Convention.
- .2 **Other Method** means an alternative to a Method defined in paragraph 3.1.1 above, which provides a level of protection equivalent to the requirements specified in regulations B-3.1 to B-3.5 of the BWM Convention.

4 APPLICABILITY

4.1 The Procedure applies to all Administrations, Parties to the BWM Convention and other IMO Member States, seeking approval in principle for an Other Method under regulation B-3.7 or assessing or granting approval for such Other Methods. This Procedure is also for the use of the Committee when considering approval in principle.

4.2 Equipment manufacturers wanting to seek approval for an Other Method should also consult this Procedure.

4.3 Ballast water management methods subject to regulation A-4.1 of the BWM Convention are not subject to this procedure or to regulation B-3.7.

5 APPLICATION TO THE COMMITTEE FOR APPROVAL IN PRINCIPLE OF AN OTHER METHOD

5.1 The information provided to support the application for approval in principle should be complete, of sufficient quality and in accordance with this Procedure.

5.2 The applicant for approval in principle of an Other Method should provide independently validated and/or operational proof that the Other Method being submitted:

- .1 provides a level of protection at least equivalent to that provided by the requirements specified in regulations B-3.1 to B-3.5 of the BWM Convention; and
- .2 is capable of providing a consistent level of protection at all times in all environments/locations.

Equivalence and benchmark criteria for an application for approval in principle of an Other Method

5.3 Applications for Other Methods should contain a fully developed independently validated approach for assessing the level of protection provided by that Other Method against the transfer of harmful aquatic organisms and pathogens and its equivalence to the requirements in regulations B-3.1 to B-3.5 of the BWM Convention and the additional requirements outlined in this Procedure, as appropriate. A possible starting point for such an approach could be a comparison of the level of protection ensured by ballast water management in compliance with regulations B-3.1 to B-3.5 and the level of protection ensured by the Other Method if used on comparable ships.

5.4 Other Methods should demonstrate by risk assessment, independently validated physical and biological modelling, operational testing of this modelling and full-scale operational testing, where applicable, that the Other Method is capable of meeting at all times a level of protection that is at least equivalent to the level of protection with respect to the prevention of the transfer of harmful aquatic organisms and pathogens via discharge of ballast water compared to existing requirements. The risk assessment should be at least to the same level of rigour as stipulated in Guidelines (G7).

5.5 Applications for Other Methods should specify the benchmark against which the performance of any systems based on that particular Other Method can be measured. The benchmark would:

- .1 enable a transparent comparison by the Committee of the level of protection provided by the Other Method with that provided by the requirements in regulations B-3.1 to B-3.5 of the BWM Convention;
- .2 be measurable and able to be evaluated for approval (similar to the requirements of the Convention, i.e. D-1 being a process evaluation, while D-2 is a measurable performance standard);
- .3 be verifiable by port and flag States through sampling, records or other processes (to be properly defined, listed and technically explained/clarified, in the pertinent application, in terms of proposed verifications for flag State or port State control inspections to be carried out on board);
- .4 need to be contained in the application, agreed by the Committee and then be used for consideration of approval through compliance testing by Port State Control;
- .5 provide an assurance that systems based on an Other Method are providing the same level of protection for the environment as the Other Method that has received the approval in principle from the Committee; and
- .6 be based on a recognized international standard, where appropriate, so long as they can be proved as equivalent to the existing requirements.

5.6 An Other Method may provide the same level of protection for the environment, human health, property or resources where:

- .1 the ballasting and de-ballasting process does not transfer harmful aquatic organisms and pathogens; or
- .2 the ballast water discharge contains no harmful aquatic organisms and pathogens.

Sampling protocol criteria for an application for approval in principle of an Other Method

5.7 The application for an Other Method should contain a ballast water sampling and analysis protocol that should be consistent with the Guidelines for ballast water sampling (G2).

Ship and personnel safety criteria for an application for approval in principle of an Other Method

5.8 The application should include a Formal Safety Assessment or a Safety Case to ensure that the Other Method or system based on an Other Method is safe for installation on board ship and any risks to the ship's crew resulting from the system are identified and adequately addressed. This Formal Safety Assessment or Safety Case should be consistent with part 3 of the annex to the Guidelines for approval of ballast water management systems (G8) and approved by the Administration.

6 SUBMISSION PROCESS

6.1 The applicant should evaluate the Other Method against the benchmark according to a protocol that is approved by an Administration.

6.2 The applicant should then prepare an application for the Other Method and submit it to the Member State concerned.

6.3 The Administration should review the application to ensure it is satisfactory (i.e. contains all of the information that is required and the information provided is of a sufficient standard to enable a decision to be made by the Committee). If the application is satisfactory, the Member State should submit a proposal for approval in principle to the Committee taking into account the deadlines prior to the MEPC at which approval in principle is to be sought.

6.4 When in session, the Committee should decide if the proposal is acceptable for consideration by the Committee and set the time frame for the evaluation of the proposal as follows:

- .1 the Committee may commission an independent review of the risk assessment method, data and assumptions in order to ensure that a scientifically rigorous analysis has been conducted. The review should be undertaken by independent experts with ecological, aquatic biology, ship design and operation, and risk assessment expertise; and
- .2 the reviewers' report should be in written form and circulated to the Parties, Members of the Organization, the United Nations and its Specialized Agencies, intergovernmental organizations having agreements with the Organization and non-governmental organizations in consultative status with the Organization, prior to its consideration by the Committee.

6.5 All proprietary data should be treated as confidential by the Committee, the competent authorities involved, and the independent reviewers, if any. However, all information related to safety and environmental protection, including physical/chemical properties and data on environmental fate and toxicity, should be treated as non-confidential.

6.6 The Committee should evaluate the application for approval in principle of an Other Method in accordance with this Procedure.

7 ASSESSMENT OF EQUIVALENCE

7.1 The Committee should review the benchmarks detailed in the application and, as appropriate, take them into account when assessing equivalence to the level of protection for the environment, human health, property or resources as provided for in regulations B-3.1 to B-3.5.

7.2 Other Methods designed to provide at least an equivalent level of protection with respect to the prevention of the transfer of harmful aquatic organisms and pathogens via discharge of ballast water should demonstrate by risk assessment, independently validated physical and biological modelling, operational testing of this modelling and full-scale operational testing, where applicable, that the Other Method is capable of meeting a level of protection at all times that is, at least equivalent to, or better than, the applicable requirements contained in the BWM Convention.

7.3 Risk assessment is the logical process for assigning the likelihood and consequences of specific events, such as entry, establishment or spread of harmful aquatic organisms and pathogens in situations where a direct comparison of application benchmarks with the D-1 and D-2 standards is not possible.

7.4 In undertaking risk assessment to consider and evaluate the equivalence of an Other Method with the existing standards, the risk assessment principles outlined in the Guidelines for risk assessment under regulation A-4 of the BWM Convention (G7) should be carefully applied. The lack of full scientific certainty should be carefully considered in the decision-making process.

Equivalence with the D-1 standard

7.5 Other Methods designed to provide equivalence to the D-1 standard can be used only until the ship type, under the BWM Convention, is required to comply with the D-2 standard (unless the system proves it can also provide equivalence to the D-2 standard):

- .1 these methods should demonstrate through risk assessment, independently validated physical and biological modelling, operational testing of this modelling and full-scale operational testing of systems based on Other Methods, where applicable, that the Other Method is capable of meeting at all times a level of protection that is, at least equivalent to, or better than, regulation D-1 of the BWM Convention;
- .2 if there is a question about the environmental impact of an Other Method during its development, such approval should be split in the same way as it is in Procedure (G9). That is, Other Methods should be approved by the Administration and Committee based on independently validated data prior to being tested at sea; and
- .3 the relevant water quality parameters (e.g., suspended solids, salinity, oxygen concentration, particulate organic matter) should be reasonably the same in the incoming as well as in the outflowing water.

Equivalence with the D-2 standard

7.6 Other Methods designed to provide equivalence to the D-2 standard should demonstrate through risk assessment, independently validated physical and biological modelling, operational testing of this modelling and full-scale operational testing of systems based on Other Methods, where applicable, that the Other Method is capable of meeting at all times a level of protection that is at least equivalent to, or better than, regulation D-2 of the BWM Convention, as follows:

- .1 where appropriate, benchmarks should be based on recognized international standards as long as they can be proven to provide an equivalent level of protection to the D-2 standard;
- .2 the description of the main characteristics of the ballast water as well as the absence/presence of harmful aquatic organisms is to be supported by independent verification; and
- .3 onboard test results, equipment specification and quality assurance should be available.

8 APPROVAL

8.1 The approval takes place in two steps:

- .1 an approval in principle of the Other Method following review and evaluation by the Committee (regulation B-3.7); and
- .2 an approval of the Other Method in a manner analogous to Guidelines (G8) and (G10), by the Administration.

Assessment for approval in principle

8.2 The application for approval in principle should be assessed by the Committee to ascertain whether:

- .1 the application for approval in principle is complete, of sufficient quality, and in accordance with this Procedure;
- .2 the Other Method does not cause any unacceptable adverse effects to environment, human health, property or resources;
- .3 the Other Method does not contravene other regulations in the BWM Convention, or any other convention or code applicable to the ship type;
- .4 the Other Method ensures at least the same level of protection to the environment, human health, property or resources as those methods permitted under regulations B-3.1 to B-3.5; and
- .5 the Procedure for approval set out by the Administration is appropriate.

8.3 The application should not be granted approval in principle when there is absence of information or significant uncertainty.

8.4 The Committee should decide whether to approve in principle the proposal, introduce any modifications thereto, if appropriate, taking into account the reviewers' report.

8.5 The Administration that submitted the application to the Committee should inform in writing the applicant about the decision made with regard to the Other Method.

Approval by the Administration

8.6 An Other Method, having received approval in principle from the Committee, is to be approved by an Administration.

8.7 A shipboard system may need to be assessed for Type Approval.

8.8 The Administration should evaluate an Other Method for safety to the environment, human health, property, or resources.

9 NOTIFICATION OF APPROVAL

9.1 The Committee will record the approval in principle of Other Methods and circulate the list once a year including the following information:

- the document reference of the approval in principle of the Other Method by the Committee;
- name and brief description of the Other Method;
- name of ballast water management system that makes use of the Other Method if appropriate;
- date of approval;

- name of applicant;
- the benchmark that the Other Method is designed to meet, and the methods of assessing compliance to this benchmark;
- copies of or access routes to test reports, test methods, etc. (as resolution MEPC.175(58)); and
- any other specifications, if necessary.

9.2 Administrations, when approving an Other Method should report to the Committee in a manner consistent with resolution MEPC.175(58) "Information reporting on Type Approved ballast water management systems".

10 MODIFICATION

10.1 The holder of an Other Method approval should report any modifications to the Administration.

10.2 Any modifications to an approved Other Method should be re-evaluated in accordance with this Procedure.

11 WITHDRAWAL OF APPROVAL

11.1 The Committee may withdraw any approval in principle in the following circumstances:

- .1 if the Other Method or system based on an Other Method no longer conforms to requirements due to amendments of the BWM Convention;
- .2 if any data or test records differ materially from data relied upon at the time of approval and are deemed not to satisfy the approval criteria;
- .3 if a request for withdrawal of approval is made by the Administration on behalf of the holder of an Other Method approval; and
- .4 if unreasonable harm to environment, human health, property or resources is determined to have been caused by an approved Other Method.

11.2 The decision to withdraw an approval in principle should specify all necessary further details, including the date upon which the withdrawal takes effect.

12 USE ON SHIPS

12.1 Ships using an Other Method under regulation B-3.7 of the BWM Convention, to meet their obligations under this Convention, can only do so once the Other Method has been approved in principle by the Committee and has been approved by an Administration.

ANNEX 5

DRAFT BWM CIRCULAR

GUIDANCE ON SCALING OF BALLAST WATER MANAGEMENT SYSTEMS

1 The Marine Environment Protection Committee, at its [sixty-second session (11 to 15 July 2011)], approved the Guidance on scaling of ballast water management systems developed by the BLG Sub-Committee at its fifteenth session (7 to 11 February 2011), as set out in the annex.

2 Member Governments and international organizations are invited to bring the annexed Guidance to the attention of all parties concerned.

ANNEX

GUIDANCE ON SCALING OF BALLAST WATER MANAGEMENT SYSTEMS

1 Reference in the Guidelines (G8)

- 1.1 In addition to the definitions given in the Guidelines (G8), the following terms are defined:
- .1 *Base unit* is a ballast water treatment equipment as defined in the Guidelines (G8).
 - .2 *Scaled unit* is the ballast water treatment equipment that is based on the base unit but has been modified to accommodate a higher or lower treatment rated capacity (TRC).
- 1.2 An equipment review and certification of a scaled system should be undertaken by the Administration. Such a review should be supported by:
- .1 Mathematical modelling and/or calculations demonstrating that any parameters that would affect system performance are equivalent between base and scaled units; and
 - .2 The results of the environmental tests specified in Part 3 of the Annex to Guidelines (G8), for each configuration of scaled units, should such tests be required by the Administration.
- 1.3 The assumptions made for the scaling of the base unit should be verified for each scaled unit (i.e. discrete models, e.g., 250 m³/h, 500 m³/h, 1,000 m³/h) by testing to the requirements of Part 2 of the Annex to the Guidelines (G8) for shipboard tests (hereafter referred to as shipboard tests). The time required in paragraph 2.2.2.7 of the Guidelines (G8) may be reduced from 6 to 3 months.
- 1.4 The same consideration should be given for scaled systems (i.e. discrete models, e.g., TRC=250 m³/h, 500 m³/h, 1,000 m³/h) that are tested according to the requirements for land-based tests.
- 1.5 In the case where all discrete models are tested according to the requirements for land-based tests, the most vulnerable model should be tested according to the requirements for shipboard tests, to demonstrate the ability of the model to operate in normal ships' conditions.
- 1.6 Combinations of base units and scaled units which have been verified in their performance according to paragraphs 1.2 to 1.5 should be regarded as multiple units mounted in parallel and do not fall within the scope of this document.
- 1.7 Failing to meet the provisions of 1.2 to 1.5, each scaled system should be tested according to the requirements for land-based tests and shipboard tests.
- 1.8 If scaling and shipboard testing is intended to be utilized to type approve a system beyond its currently approved TRC without land-based testing then the following process applies:

- .1 The documentation specified in paragraph 1.5 should identify the key internal and external performance parameters (e.g., dosage concentration, UV intensity, filter flux density, etc.) required to achieve the system's efficacy, and also specify the physical/environmental conditions and design parameters that affect these.
 - .2 Validated mathematical model and/or calculations should be used to predict that the key performance parameters will be achieved in the scaled unit design and that the fundamental mechanism of operation is not changed.
 - .3 It should be verified through shipboard testing that the scaled unit achieves the critical values of the key performance parameters utilizing the design determined by the model and or calculations identified in subparagraph 1.8.2.
 - .4 Modelling should address the efficacy and environmental impact of the system. The actual chemical analysis for by-products should be performed during shipboard testing, if necessary.
- 1.9 A representative number of scaled systems capacities, taking into account the treatment technology, should be tested according to the requirements for shipboard tests.

2 Reference in the Procedure (G9)

- 2.1 When scaling from systems that have received Basic and Final Approval from the Committee according to the Procedure (G9), the manufacturer and the Administration should ensure that any conditions on Final Approval of the base unit are still met for the scaled system or systems.

3 Issuing of Type Approval for systems using scaled units

- 3.1 The Type Approval Certificate issued by the Administration should include each and every scaled system if the scaling is done according to these procedures.

4 Application to existing Type Approvals involving scaled units

- 4.1 Administrations are encouraged to apply this guidance to systems having received Type Approval involving scaled units prior to the adoption of this guidance to the greatest extent possible.

ANNEX 6

DRAFT MEPC RESOLUTION

**GUIDELINES FOR THE CONTROL AND MANAGEMENT OF SHIPS' BIOFOULING
TO MINIMIZE THE TRANSFER OF INVASIVE AQUATIC SPECIES**

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38 of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee relating to any matter within the scope of the Organization concerned with the prevention and control of marine pollution from ships,

RECALLING ALSO that Member States of the International Maritime Organization made a clear commitment to minimizing the transfer of invasive aquatic species by shipping in adopting the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004,

RECALLING FURTHER that studies have shown biofouling on ships to be an important means of transferring invasive aquatic species, which if established in new ecosystems, may pose threats to the environment, human health, property and resources,

NOTING the objectives of the Convention on Biological Diversity, 1992, and that the transfer and introduction of aquatic invasive species through ships' biofouling threatens the conservation and sustainable use of biological diversity,

NOTING ALSO that implementing practices to control and manage ships' biofouling can greatly assist in reducing the risk of the transfer of invasive aquatic species,

NOTING FURTHER that this issue, being of worldwide concern, demands a globally consistent approach to the management of biofouling,

HAVING CONSIDERED, at its sixty-second session, the draft Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species, developed by the Sub-Committee on Bulk Liquids and Gases,

1. ADOPTS the Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species, as set out in the annex to the present resolution;
2. REQUESTS Member States to take urgent action in applying these Guidelines, including; the dissemination thereof to the shipping industry and other interested parties, taking these Guidelines into account when adopting measures to minimize the risk of introducing invasive aquatic species via biofouling, and reporting to the MEPC on any experience gained in their implementation;
3. AGREES to keep these Guidelines under review in light of the experience gained.

ANNEX

**DRAFT GUIDELINES FOR THE CONTROL AND MANAGEMENT OF SHIPS'
BIOFOULING TO MINIMIZE THE TRANSFER OF INVASIVE AQUATIC SPECIES**

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1 INTRODUCTION

1.1 In the adoption of the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (BWM Convention), Member States of the International Maritime Organization (IMO) made a clear commitment to minimizing the transfer of invasive aquatic species by shipping. Studies have shown that biofouling can also be a significant vector for the transfer of invasive aquatic species. Biofouling on ships entering the waters of States may result in the establishment of invasive aquatic species which may pose threats to human, animal and plant life, economic and cultural activities and the aquatic environment.

1.2 While the International Convention on the Control of Harmful Anti-Fouling Systems on Ships, 2001 (AFS Convention) addresses anti-fouling systems on ships, its focus is on the prevention of adverse impacts from the use of anti-fouling systems and the biocides they may contain, rather than preventing the transfer of invasive aquatic species.

1.3 The potential for invasive aquatic species transferred through biofouling to cause harm has been recognized by the IMO, the Convention on Biological Diversity (CBD), several UNEP Regional Seas Conventions (e.g., Barcelona Convention for the Protection of the Mediterranean Sea Against Pollution), the Asia Pacific Economic Cooperation forum (APEC), and the Secretariat of the Pacific Region Environmental Program (SPREP).

1.4 All ships have some degree of biofouling, even those which may have been recently cleaned or had a new application of an anti-fouling coating system. Studies have shown that the biofouling process begins within the first few hours of a ship's immersion in water. The biofouling that may be found on a ship is influenced by a range of factors, such as follows:

- .1 design and construction, particularly the number, location and design of niche areas;
- .2 specific operating profile, including factors such as operating speeds, ratio of time underway compared with time alongside, moored or at anchor, and where the ship is located when not in use (e.g., open anchorage or estuarine port);
- .3 places visited and trading routes; and
- .4 maintenance history, including: the type, age and condition of any anti-fouling coating system, installation and operation of anti-fouling systems and dry-docking/slipping and hull cleaning practices.

1.5 Implementing practices to control and manage biofouling can greatly assist in reducing the risk of the transfer of invasive aquatic species. Such management practices can also improve a ship's hydrodynamic performance and can be effective tools in enhancing energy efficiency and reducing air emissions from ships. This concept has been identified by the IMO in the "Guidance for the development of a ship energy efficiency management plan (SEEMP)" (MEPC.1/Circ.683).

1.6 These Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species (hereafter "the Guidelines") are intended to provide a globally consistent approach to the management of biofouling. As scientific and technological advances are made, the Guidelines will be refined to enable the risk to be more adequately addressed. Port States, flag States, coastal States and other parties that can assist in mitigating the problems associated with biofouling should exercise due diligence to implement the Guidelines to the maximum extent possible.

2 DEFINITIONS

2.1 For the purposes of these Guidelines, the following definitions apply:

AFS Convention means the International Convention on the Control of Harmful Anti-Fouling Systems on Ships, 2001.

Anti-fouling coating system means the combination of all component coatings, surface treatments (including primer, sealer, binder, anti-corrosive and anti-fouling coatings) or other surface treatments, used on a ship to control or prevent attachment of unwanted aquatic organisms.

Anti-fouling system means a coating, paint, surface treatment, surface, or device that is used on a ship to control or prevent attachment of unwanted organisms.

Biofouling means the accumulation of aquatic organisms such as micro-organisms, plants, and animals on surfaces and structures immersed in or exposed to the aquatic environment. Biofouling can include microfouling and macrofouling (see below).

In-water cleaning means the physical removal of biofouling from a ship while in the water.

Invasive aquatic species means a species which may pose threats to human, animal and plant life, economic and cultural activities and the aquatic environment.

Marine Growth Prevention System (MGPS) means an anti-fouling system used for the prevention of biofouling accumulation in internal seawater cooling systems and sea chests and can include the use of anodes, injection systems and electrolysis.

Member States means States that are Members of the International Maritime Organization.

Macrofouling means large, distinct multicellular organisms visible to the human eye such as barnacles, tubeworms, or fronds of algae.

Microfouling means microscopic organisms including bacteria and diatoms and the slimy substances that they produce. Biofouling comprised of only microfouling is commonly referred to as a slime layer.

Niche areas mean areas on a ship that may be more susceptible to biofouling due to different hydrodynamic forces, susceptibility to coating system wear or damage, or being inadequately, or not, painted, e.g., sea chests, bow thrusters, propeller shafts, inlet gratings, dry-dock support strips, etc.

Organization means the International Maritime Organization.

Port State authority means any official or organization authorized by the Government of a port State to verify the compliance and enforcement of standards and regulations relevant to the implementation of national and international shipping control measures.

Ship means a vessel of any type whatsoever operating in the aquatic environment and includes hydrofoil boats, air-cushion vehicles, submersibles, floating craft, fixed or floating platforms, floating storage units (FSUs) and floating production storage and off-loading units (FPSOs).

States means coastal, port or Member States as appropriate.

Treatment means a process which may use a mechanical, physical, chemical or biological method to remove or render sterile, invasive or potentially invasive aquatic species fouling a ship.

3 APPLICATION

3.1 The Guidelines are intended to provide useful recommendations on general measures to minimize the risks associated with biofouling for all types of ships and are directed to States, shipmasters, operators and owners, shipbuilders, ship cleaning and maintenance operators, port authorities, ship repair, dry-docking and recycling facilities, ship designers, classification societies, anti-fouling paint manufacturers and suppliers and any other interested parties. A State should determine the extent that the Guidelines are applied within that particular State.

3.2 A separate guidance document, based on these Guidelines, provides advice relevant to owners and/or operators of recreational craft less than 24 metres in length, using terminology appropriate for that sector.

3.3 States should inform the Organization of any relevant biofouling regulations, management requirements or restrictions they are applying to international shipping.

4 OBJECTIVES

4.1 The objectives of these Guidelines are to provide practical guidance to States, ship masters, operators and owners, shipbuilders, ship repair, dry-docking and recycling facilities, ship cleaning and maintenance operators, ship designers, classification societies, anti-fouling paint manufacturers and suppliers and any other interested parties, on measures to minimize the risk of transferring invasive aquatic species from ships' biofouling. It is important that biofouling management procedures be effective as well as environmentally safe, practical, designed to minimize costs and delays to the ship, and based upon these Guidelines whenever possible.

4.2 To minimize the transfer of invasive aquatic species, a ship should implement biofouling management practices, including the use of anti-fouling systems and other operational management practices to reduce the development of biofouling. The intent of such practices is to keep the ship's submerged surfaces, and internal seawater cooling systems, as free of biofouling as practical. A ship following this guidance and minimizing macrofouling would have a reduced potential for transferring invasive aquatic species via biofouling.

4.3 The management measures outlined within these Guidelines are intended to complement current maintenance practices carried out within the industry.

5 BIOFOULING MANAGEMENT PLAN AND RECORD BOOK

5.1 Implementation of an effective biofouling management regime is critical for minimizing the transfer of invasive aquatic species. The biofouling management measures to be undertaken on a ship should be outlined in a biofouling management plan, and records of biofouling management practices kept in a biofouling record book, as outlined below.

Biofouling Management Plan

5.2 It is recommended that every ship should have a biofouling management plan. The intent of the plan should be to provide effective procedures for biofouling management. An example of a Biofouling Management Plan is outlined in appendix 1 of these Guidelines. The Biofouling Management Plan may be a stand-alone document, or integrated in part or fully, into the existing ships' operational and procedural manuals and/or planned maintenance system.

5.3 The biofouling management plan should be specific to each ship and included in the ship's operational documentation. Such a plan should address, among other things, the following:

- .1 relevant parts of these Guidelines;
- .2 details of the anti-fouling systems and operational practices or treatments used, including those for niche areas;
- .3 hull locations susceptible to biofouling, schedule of planned inspections, repairs, maintenance and renewal of anti-fouling systems;
- .4 details of the recommended operating conditions suitable for the chosen anti-fouling systems and operational practices;
- .5 details relevant for the safety of the crew, including details on the anti-fouling system(s) used; and
- .6 details of the documentation required to verify any treatments recorded in the Biofouling Record Book as outlined in appendix 2.

5.4 The biofouling management plan should be updated as necessary.

Biofouling Record Book

5.5 It is recommended that a Biofouling Record Book is maintained for each ship. The book should record details of all inspections and biofouling management measures undertaken on the ship. This is to assist the shipowner and operator to evaluate the efficacy of the specific anti-fouling systems and operational practices on the ship in particular, and of the biofouling management plan in general. The record book could also assist interested State authorities to quickly and efficiently assess the potential biofouling risk of the ship, and thus minimize delays to ship operations. The Biofouling Record Book may be a stand-alone document, or integrated in part, or fully, into the existing ships' operational and procedural manuals and/or planned maintenance system.

5.6 It is recommended that the Biofouling Record Book be retained on the ship for the life of the ship.

5.7 Information that should be recorded in a Biofouling Record Book includes the following:

- .1 details of the anti-fouling systems and operational practices used (where appropriate as recorded in the Anti-fouling System Certificate), where and when installed, areas of the ship coated, its maintenance and, where applicable, its operation;

- .2 dates and location of dry-dockings/slippings, including the date the ship was re-floated, and any measures taken to remove biofouling or to renew or repair the anti-fouling system;
- .3 the date and location of in-water inspections, the results of that inspection and any corrective action taken to deal with observed biofouling;
- .4 the dates and details of inspection and maintenance of internal seawater cooling systems, the results of these inspections, and any corrective action taken to deal with observed biofouling and any reported blockages; and
- .5 details of when the ship has been operating outside its normal operating profile including any details of when the ship was laid-up or inactive for extended periods of time.

5.8 An example of a Biofouling Record Book and information to be recorded is included as appendix 2 to these Guidelines.

6 ANTI-FOULING SYSTEM INSTALLATION AND MAINTENANCE

6.1 Anti-fouling systems and operational practices are the primary means of biofouling prevention and control for existing ships' submerged surfaces, including the hull and niche areas. An anti-fouling system can be a coating system applied to exposed surfaces, biofouling resistant materials used for piping and other unpainted components, marine growth prevention systems (MGPSs) for sea chests and internal seawater cooling systems, or other innovative measures to control biofouling.

6.2 The anti-fouling system used should comply with the AFS Convention, where necessary.

Choosing the anti-fouling system

6.3 Different anti-fouling systems are designed for different ship operating profiles so it is essential that ship operators, designers and builders obtain appropriate technical advice to ensure an appropriate system is applied or installed. If an appropriate anti-fouling system is not applied, biofouling accumulation increases.

6.4 Some factors to consider when choosing an anti-fouling system include the following:

- .1 planned periods between dry-docking – including any mandatory requirements for ships survey;
- .2 ship speed – different anti-fouling systems are designed to optimize anti-fouling performance for specific ship speeds;
- .3 operating profile – patterns of use, trade routes and activity levels, including periods of inactivity, influence the rate of biofouling accumulation;
- .4 ship type and construction; and
- .5 any legal requirements for the sale and use of the anti-fouling systems.

6.5 Consideration should also be given to the need for tailored, differential installation of anti-fouling coating systems for different areas of the ship to match the required performance and longevity of the coating with the expected wear, abrasion and water flow rates in specific areas, such as the bow, rudder, or internal seawater cooling systems and sea chest interiors.

Installing, re-installing, or repairing the anti-fouling system

6.6 Whether installing, re-installing or repairing the anti-fouling system, care should be taken in surface preparation to ensure all biofouling residues, flaking paint, or other surface contamination is completely removed, particularly in niche areas, to facilitate good adhesion and durability of the anti-fouling system.

6.7 For sea chests the following should be considered when installing, re-installing, or repairing their anti-fouling systems:

- .1 inlet grates and the internal surfaces of sea chests should be protected by an anti-fouling coating system that is suitable for the flow conditions of seawater over the grate and through the sea chest;
- .2 care should be taken in surface preparation and application of any anti-fouling coating system to ensure adequate adhesion and coating thickness. Particular attention should be paid to the corners and edges of sea chests, blowout pipes, holding brackets and the bars of grates. Grates may require a major refurbishment type of surface preparation at each dry-docking to ensure coating durability; and
- .3 the installation of MGPSs is encouraged to assist in treating the sea chest and internal seawater piping as part of the biofouling management plan. A careful evaluation of the consequential effects of MGPSs should be made before installation, including potential effects on the ship and/or the environment and the existence of regulations affecting the use of MGPSs.

6.8 Other niche areas can also be particularly susceptible to biofouling growth. Management measures for niche areas are outlined below.

- .1 **Dry-docking support strips** – Positions of dry-docking blocks and supports should be varied at each dry-docking, or alternative arrangements made to ensure that areas under blocks are painted with anti-fouling, at least at alternate dry-dockings. These areas should receive a major refurbishment type of surface preparation and be coated at each dry-docking that they are accessible. Where it is not possible to alternate the position of dry-docking support strips, e.g., in critical weight bearing areas such as under the engine-room, these areas should be specially considered and managed by other means, e.g., the application of specialized coatings or procedures.
- .2 **Bow and stern thrusters** – The body and area around bow, stern and any other thrusters prone to coating damage, should be routinely maintained at dry-dockings. Particular attention should be paid to any free flooding spaces which may exist around the thruster tunnel. The housings/recesses, and retractable fittings such as stabilizers and thruster bodies, should have an anti-fouling coating system of adequate thickness for optimal effectiveness.

- .3 **Edges and weld joints** – Exposed edges on the hull, such as around bilge keels and scoops, and weld joints, should be faired and coated to ensure adequate coating thickness to optimize system effectiveness.
- .4 **Rudder hinges and stabilizer fin apertures** – Recesses within rudder hinges and behind stabilizer fins need to be carefully and effectively cleaned and re-coated at maintenance dry-dockings. Rudders and stabilizer fins should be moved through their full range of motion during the coating process to ensure that all surfaces are correctly coated to the specification of the anti-fouling system. Rudders, rudder fittings and the hull areas around them should also be adequately coated to withstand the increased wear rates experienced in these areas.
- .5 **Propeller and shaft** – Propellers and immersed propeller shafts should be coated with fouling release coatings where possible and appropriate, to maintain efficiency and enable self-cleaning, so that the need for regular in-water cleaning and polishing is minimized.
- .6 **Stern tube seal assemblies and the internal surfaces of rope guards** – Exposed sections of stern tube seal assemblies and the internal surfaces of rope guards should be carefully painted with anti-fouling coating systems appropriate to the degree of water movement over and around these surfaces.
- .7 **Cathodic protection (CP) anodes** – Niche areas for biofouling can be minimized if: anodes are flush-fitted to the hull; a rubber backing pad is inserted between the anode and the hull; or the gap is caulked. Caulking the gap will make the seam or joint watertight. If not flush-fitted, the hull surface under the anode and the anode strap should be coated with an anti-fouling coating system suitable for low water flow to prevent biofouling accumulation. If anodes are attached by bolts recessed into the anode surface, the recess should be caulked to remove a potential niche.
- .8 **Pitot tubes** – Where retractable pitot tubes are fitted, the housing should be internally coated with an anti-fouling coating system suitable for static conditions.
- .9 **Sea inlet pipes and overboard discharges** – Anti-fouling coating systems should be applied inside the pipe opening and accessible internal areas. The anti-corrosive or primer coating selected should be appropriate to the specific pipe material if this material is different to the hull. Care should be taken in surface preparation and coating application to ensure good adhesion and coating thickness.

Procedures for ship maintenance and recycling facilities

6.9 Ship maintenance and recycling facilities should adopt measures (consistent with applicable national and local laws and regulations) to ensure that viable biofouling organisms or chemical and physical pollutants are not released into the local aquatic environment. These measures include the following:

- .1 capturing biological material to minimize the risk of organism survival and establishment and other impacts of biological material being released into the aquatic environment;

- .2 treating and/or disposing of captured biological material in an environmentally appropriate manner;
- .3 scheduling of ships' arrival and departure at cleaning and maintenance facilities and at locations where ships are moored while waiting for cleaning and maintenance to minimize the risk of fouled ships contaminating other ships and the surrounding environment;
- .4 removing biofouling from all underwater surfaces of a ship when in dry-dock, including niche areas; and
- .5 lowering or extending retractable equipment such as stabilizers, thrusters, transducers and similar when a ship is in dry-dock or slipped, to permit access for the removal of biofouling from the equipment and its housing.

7 IN-WATER INSPECTION, CLEANING AND MAINTENANCE

7.1 Despite the use of effective anti-fouling systems and operational practices, undesirable amounts of biofouling may still accumulate during the intended lifetime of the anti-fouling system. To maintain a ship as free of biofouling as practical, it may be advisable for the ship to undertake in-water inspection, cleaning and maintenance.

In-water inspection of ships

7.2 In-water inspection can be a useful and flexible means to inspect the condition of anti-fouling systems and the biofouling status of a ship. In-water inspections should be undertaken periodically as a general means of routine surveillance, augmented by specific inspections as necessary to address any situations of elevated risk. Specific occasions when an in-water inspection may be appropriate, include the following:

- .1 before and after any planned period of inactivity or significant or unforeseen change to the ship's operating profile;
- .2 prior to undertaking in-water cleaning to determine the presence of known or suspected invasive aquatic species or other species of concern on the ship;
- .3 after a known or suspected marine pest or other species of concern is discovered in a ship's internal seawater cooling systems; and
- .4 following damage to, or premature failure of, the anti-fouling system.

7.3 It is recommended that ship operators identify niche areas on the ship that may accumulate biofouling to enable these areas to be effectively targeted during inspections. Areas may include the following:

- propeller thrusters and propulsion units;
- sea chests;
- rudder stock and hinge;
- stabilizer fin apertures;
- rope guards, stern tube seals and propeller shafts;

- cathodic protection anodes;
- anchor chain and chain lockers;
- free flood spaces inherent to the ships' design;
- sea chest and thruster tunnel grates;
- echo sounders and velocity probes;
- overboard discharge outlets and sea inlets; and
- areas prone to anti-fouling coating system damage or grounding (e.g., areas of the hull damaged by fenders when alongside, leading edges of bilge keels and propeller shaft "y" frames).

7.4 Dive and remotely operated vehicle (ROV) surveys can be practical options for in-water inspections although they do have limitations regarding visibility and available dive time compared with the area to be inspected, and difficulties with effectively accessing many biofouling prone niches. Such surveys should be undertaken by persons who are suitably qualified and experienced and familiar with biofouling and associated invasive aquatic species risks and the safety risks relating to in-water surveys. Regulatory authorities may have recommended or accredited biofouling inspection divers.

In-water cleaning and maintenance

7.5 In-water cleaning can be an important part of biofouling management. In-water cleaning can also introduce different degrees of environmental risk, depending on the nature of biofouling (i.e. microfouling versus macrofouling), the amount of anti-fouling coating system residue released and the biocidal content of the anti-fouling coating system. Relative to macrofouling, microfouling can be removed with gentler techniques that minimize degradation of the anti-fouling coating system and/or biocide release. Microfouling removal may enhance a ship's hull efficiency, reducing fuel consumption and greenhouse gas emissions. It is, therefore, recommended that the ship's hull is cleaned when practical by soft methods if significant microfouling occurs. In-water cleaning can also reduce the risk of spreading invasive aquatic species by preventing macrofouling accumulation.

7.6 It may be appropriate for States to conduct a risk assessment to evaluate the risk of in-water cleaning activities and minimize potential threats to their environment, property and resources. Risk assessment factors could include the following:

- .1 biological risk of the biofouling organisms being removed from the ship (including viability of the biofouling organisms or the ability to capture biofouling material);
- .2 factors that may influence biofouling accumulation, such as changes to the operating profile of the ship;
- .3 geographical area that was the source of the biofouling on the ship, if known; and

- .4 toxic effects related to substances within the anti-fouling coating system that could be released during the cleaning activity, and any subsequent damage to the anti-fouling coating system.

7.7 Personnel proposing to undertake in-water cleaning should be aware of any regulations or requirements for the conduct of in-water cleaning, including any regulations regarding the discharge of chemicals into the marine environment and the location of sensitive areas (such as marine protected areas and ballast water exchange areas). Where significant macrofouling growth is detected, it should be removed or treated (if this can be done without damaging the anti-fouling system) in accordance with such regulations. Where available, appropriate technology should be used to minimize the release of both anti-fouling coating or paint debris, and viable adult, juvenile, or reproductive stages of macrofouling organisms. The collected material should be disposed of in a manner which does not pose a risk to the aquatic environment.

7.8 For immersed areas coated with biocidal anti-fouling coatings, cleaning techniques should be used that minimize release of biocide into the environment. Cleaning heavily fouled anti-fouling coating systems can not only generate biofouling debris, but prematurely depletes the anti-fouling coating system and may create a pulse of biocide that can harm the local environment and may impact on future applications by the port authority for the disposal of dredge spoil. Depleted anti-fouling coating systems on hulls will rapidly re-foul. In-water cleaning or scrubbing of hulls for the purpose of delaying dry-dockings beyond the specified service life of the coating is, therefore, not recommended.

7.9 Immersed areas coated with biocide-free anti-fouling coating systems may require regular in-water cleaning as part of planned maintenance to maintain hull efficiency and minimize the risk of transferring invasive aquatic species. Cleaning techniques should be used which do not damage the coating and impair its function.

7.10 Any maintenance or repair activities should take care not to impede future in-service cleaning and/or maintenance, e.g., care should be taken to ensure sea chest grates do not become welded shut during repair work.

7.11 Care should be taken to ensure that any MGPSs installed are operating effectively to prevent accumulation of biofouling.

7.12 Regular polishing of uncoated propellers to maintain operational efficiency will also minimize macrofouling accumulation. Uncoated propeller shafts may require cleaning at the same time as the propeller. As a ship's routine propeller polishing will involve the use of divers, it is recommended that this opportunity is taken to assess sea chests, and other similar areas, for macrofouling.

7.13 Internal seawater cooling systems need to be regularly monitored to ensure effective biofouling control is maintained. Seawater cooling systems that operate while the ship is in port may be vulnerable to biofouling accumulation, and should be closely monitored. If seawater cooling systems become fouled, they should be appropriately treated. Any discharge of treated water from internal seawater cooling systems should be undertaken in accordance with applicable regulations.

8 DESIGN AND CONSTRUCTION

8.1 Initial ship design and construction offers the most comprehensive, effective and durable means by which to minimize ship biofouling risks. In the design and construction of a ship, or when a ship is being significantly altered, the following should be taken into consideration.

- .1 Small niches and sheltered areas should be excluded from the ship as far as practical, e.g., flush mounting pipes in sea chests. Where not practical, these should be designed so that they may be easily accessed for inspection, cleaning and application of anti-fouling measures.
- .2 Rounding and/or bevelling of corners, gratings and protrusions to promote more effective coverage of anti-fouling coating systems, and hinging of gratings to enable diver access.
- .3 Providing the capacity to blank off the sea chest and other areas, such as moon pools, floodable docks and other free flood spaces, for treatment and/or cleaning.

8.2 Internal seawater cooling systems should be designed and made of appropriate material to minimize biofouling and constructed with a minimum of bends, kinks and flanges in seawater piping.

8.3 To avoid creation of avoidable niches while ensuring effective safety and operation of the ship, where practical, particular attention should be given to avoidance of unfilled gaps in all skin fittings and the detailed design of the items as follows:

- .1 sea chests – minimize size and number, and use smooth surfaces to maximize flow efficiency, fit MGPS, and steam or hot water cleaning systems, grills and their opening arrangements designed for in-water inspection and maintenance;
- .2 retractable fittings and equipment – avoid external reinforcement (such as stiffeners) where possible, design for in-water inspection and maintenance;
- .3 tunnel thrusters – tunnels to be above light water line or accessible to divers, grills and their opening arrangements designed for in-water inspection, maintenance and operation;
- .4 sponsons and hull blisters – use fully enclosed in preference to free flooding types, with access provisions made for in-water inspection, cleaning and maintenance;
- .5 stern tube seal assemblies and rope guards – design for in-water inspection, cleaning and maintenance; and
- .6 immersible and seabed equipment – ensure facilities for equipment washdown during retrieval and enclosed washdown areas for cleaning of equipment on board, if necessary, are provided.

9 DISSEMINATION OF INFORMATION

9.1 States are encouraged to maintain and exchange information relevant to these Guidelines through the Organization. Accordingly, States are encouraged to provide the Organization with the information related to the management of biofouling as follows:

- .1 copies of current regional, national and local laws, regulations, standards, exemptions or guidelines;
- .2 technical and research information, including any studies on the impact and control of invasive aquatic species in ships' biofouling, and on the efficacy and practicality of environmentally protective in-water cleaning technologies;
- .3 education materials such as CD's, DVD's or printed materials; and
- .4 the location of and the terms of use for cleaning and maintenance services and facilities for ships and equipment that comply with these Guidelines.

9.2 State authorities should provide ships with timely, clear and concise information on biofouling management measures and treatment requirements that are being applied to shipping and ensure these are widely distributed. Shipowners and operators should endeavour to become familiar with all requirements related to biofouling by requesting such information from their port or shipping agents or competent authorities (i.e. State authorities). State authorities should also provide ships with any available information on particular invasive aquatic species that may be present in a port and could attach to a ship as biofouling (e.g., if a particular species of concern is spawning) in a timely manner.

9.3 Organizations or shipping agents representing shipowners and operators should be familiar with the requirements of State authorities with respect to biofouling management and treatment procedures, including information that will be needed to obtain entry clearance. Verification and detailed information concerning State requirements should be obtained by the ship prior to arrival.

9.4 To monitor the effectiveness of these Guidelines, States, as part of the evaluation process could provide to the Organization details of records describing reasons why ships could not apply these Guidelines, e.g., design, construction or operation of a ship, particularly from the view point of ships' safety, or lack of information concerning the Guidelines.

10 TRAINING AND EDUCATION

10.1 Training for ships' masters and crews, in-water cleaning or maintenance facility operators and those surveying or inspecting ships as appropriate should include instructions on the application of biofouling management and treatment procedures, based upon the information contained in these Guidelines. Instruction should also be provided on the following:

- .1 maintenance of appropriate records and logs;
- .2 impacts of invasive aquatic species from ships' biofouling;
- .3 benefits to the ship of managing biofouling and the threats posed by not applying management procedures;

- .4 biofouling management measures and associated safety procedures; and
- .5 relevant health and safety issues.

10.2 States and industry organizations should ensure that relevant marine training organizations are aware of these Guidelines and include this in their syllabuses as appropriate.

11 OTHER MEASURES

11.1 To the extent practical, States and port authorities should aim to ensure smooth flow of ships going in and out of their ports to avoid keeping ships waiting offshore so that anti-fouling systems can operate as effectively as possible.

11.2 States may apply other measures on ships within their jurisdiction for the purpose of providing additional protection for their marine environment, or in emergency situations. In managing emergency situations for biofouling, States should consider the guidance document for ballast water emergency situations (BWM.2/Circ.17).

11.3 States should take into account these Guidelines when developing other measures and/or restrictions for managing ships' biofouling.

11.4 Where other measures are being applied, States should notify the Organization of the specific requirements, with supporting documentation, for dissemination to other States and non-governmental agencies where appropriate.

11.5 The application of other measures by States should not place the safety of the ship and crew at risk.

12 FUTURE WORK

Research needs

12.1 States and other interested parties should encourage and support research into, and development of technologies for:

- .1 minimizing and/or managing both macrofouling and microfouling particularly in niche areas (e.g., new or different anti-fouling systems and different designs for niche areas to minimize biofouling);
- .2 in-water cleaning that ensures effective management of the anti-fouling system, biofouling and other contaminants, including effective capture of biological material;
- .3 comprehensive methods for assessing the risks associated with in-water cleaning;
- .4 shipboard monitoring and detection of biofouling;
- .5 reducing the macrofouling risk posed by the dry-docking support strips, (e.g., alternative keel block designs that leave less uncoated hull area);
- .6 the geographic distribution of biofouling invasive aquatic species; and

- .7 the rapid response to invasive aquatic species incursions, including diagnostic tools and eradication methods.

12.2 Potential operational benefits of such technologies should also be highlighted and relevant information provided to the Organization.

Independent information needs

12.3 Summaries are needed of the different types of anti-fouling systems and other biofouling management measures currently available, how they work and their performance under different operating conditions and situations. This information could assist shipowners and operators when making decisions about the most appropriate coatings and coating systems for their ship type and activity.

APPENDIX 1

BIOFOULING MANAGEMENT PLAN AND RECORD BOOK

Format and content of Biofouling Management Plan

The following information should be considered when developing a Biofouling Management Plan (the Plan). It is important that the Plan be specific to each ship.

The Plan may be a stand-alone document or integrated in part or full in the ships' operational and procedures manuals and/or planned maintenance systems.

INTRODUCTION

This section should contain a brief introduction for the ship's crew, explaining the need for biofouling management, and the importance of accurate record keeping.

The Plan should state that it is to be available for viewing on request by a port State authority and should be written in the working language of the crew.

SHIP PARTICULARS

At least the following details should be included:

- Ship's name.
- Flag.
- Port of registry.
- Gross tonnage.
- Registration number (i.e. IMO number and/or other registration numbers, if applicable).
- Regulation Length.
- Beam.
- Ship type (as classified by Lloyds Register – see Table 1).
- International call sign and Maritime Mobile Service Identity (MMSI).

Table 1: Ship types, as classified by Lloyd's Register

anchor handling fire fighting tug/supply	dredger	lighthouse/tender	roll on roll off
anchor handling tug	drill platform	Liquid Natural Gas Carrier	salvage tug
anchor handling tug/supply	drill ship	Liquid Petroleum Gas Carrier	seismographic research
asphalt tanker	ferry	livestock	semi-sub heavy lift vessel
barge	fire fighting tug	meteorological research	suction dredger
bulk carrier	fire fighting tug/supply	naval auxiliary tanker	supply
bulk carrier with container capacity	fish carrier	naval vessel	support
bulk cement carrier	fish factory	oceanographic research	tank barge
bulk ore carrier	fishery protection	offshore safety	tanker (unspecified)
bunkering tanker	fishing (general)	passenger (cruise)	trailing suction hopper dredger
cable ship	floating gas production	passenger roll on roll off	training
chemical tanker	floating production tanker	patrol ship	trawler (all types)
combined bulk and oil carrier	floating storage tanker	pipe layer	tug
combined chemical and oil tanker	fully cellular containership	pollution control vessel	tug/supply
combined LNG and LPG Gas Carrier	general cargo	pontoon	vehicle carrier
combined ore and oil carrier	general cargo with container capacity	product tanker	whaler
crane barge	grab dredger	pusher tug	wood-chip carrier
crane ship	hopper barge	reefer	yacht
crude oil tanker	hopper dredger	research	
cutter suction dredger	icebreaker	research/supply ship	
diving support	landing craft	roll on roll off with container capacity	

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A table of contents should be included.

PURPOSE

The purpose of the Plan is to outline measures for the control and management of ships' biofouling in accordance with the Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species (the Guidelines). It provides operational guidance for the planning and actions required for ships' biofouling management.

DESCRIPTION OF THE ANTI-FOULING SYSTEMS

The Plan should describe the anti-fouling systems in place for different parts of the ship, including as follows:

- type(s) of anti-fouling coating systems applied;
- details of where anti-fouling systems are and are not applied or installed;
- manufacturer and product names of all coatings or products used in the anti-fouling coating systems; and
- anti-fouling system specifications (including dry film thickness for coatings, dosing and frequency for MGPSs, etc.) together with the expected effective life, operating conditions required for coatings to be effective, cleaning requirements and any other specifications relevant for paint performance.

Previous reports on the performance of the ship's anti-fouling systems should be included, if applicable, and the AFS certificate or statement of compliance or other documentation should also be referenced, as appropriate.

DESCRIPTION OF OPERATING PROFILE

The Plan should describe the ship's operating profile that has determined the performance specifications of the ship's anti-fouling systems and operational practices, including:

- typical operating speeds;
- periods underway at sea compared with periods berthed, anchored or moored;
- typical operating areas or trading routes; and
- planned duration between dry-dockings/slippings.

DESCRIPTION OF AREAS ON THE SHIP SUSCEPTIBLE TO BIOFOULING

The Plan should identify the hull areas, niche areas and seawater cooling systems on the ship that are particularly susceptible to biofouling and describe the management actions required for each area. It should also describe the actions to be taken if the ship is operating outside of the desired operating profile, or if excessive unexpected biofouling is observed, and any other actions that can be taken to minimize the accumulation of biofouling on the ship. Table 1 provides an example of an action plan.

Table 2: Biofouling management action plan

Areas of the ship which are particularly susceptible to biofouling	Management actions required for each area (e.g., inspections, cleaning, repairs and maintenance)	Management actions to be undertaken if ship operates outside its usual operating profile
External hull surfaces: <ul style="list-style-type: none"> - Vertical sides - Flats - Boottop - Bow dome - Transom 		
Hull appendages and fittings: <ul style="list-style-type: none"> - Bilge keels - A-brackets - Stabilizer fins - CP anodes 		
Steering and propulsion: <ul style="list-style-type: none"> - Propeller - Propeller shaft - Stern tube seal - Anchor chain - Chain locker - Rope guard - Rudder - Bow/Stern thrusters <ul style="list-style-type: none"> - Propeller - Thruster body - Tunnel - Tunnel grates 		
Seawater intakes and internal seawater cooling systems: <ul style="list-style-type: none"> - Engine cooling system - Sea chests (identify number and position) - Sea chest grate - Internal pipework and heat exchanger - Fire-fighting system - Ballast uptake system - Auxiliary services system 		

A diagram of the ship should be included in the Plan to identify the location of those areas of the ship that are particularly susceptible to biofouling (including access points in the internal seawater cooling systems). If necessary these should show both side and bottom views of the ship.

OPERATION AND MAINTENANCE OF THE ANTI-FOULING SYSTEM

This section should contain a detailed description of the operation and maintenance of the anti-fouling system(s) used, including schedule(s) of activities and step-by-step operational procedures.

Timing of operational and maintenance activities

This section should stipulate the schedule of planned inspections, repairs, maintenance and renewal of the anti-fouling systems.

In-water cleaning and maintenance procedures

This section should set out planned maintenance procedures (other than for on board treatment processes) that need to be completed between dry-docking events to minimize biofouling. This should include routine cleaning or other treatments. Details should be provided on the treatment/cleaning to be conducted, the specification of any equipment required, details of the areas to which each specific treatment/cleaning is to be applied, step-by-step operational procedures where relevant and any other details relevant to the processes (e.g., chemicals required for treatment, any discharge standards).

Operation of onboard treatment processes

This section should provide specific advice about MGPS fitted, internal seawater cooling systems covered by the system and any not covered, and the associated maintenance and inspection schedule and procedures. This would include information such as when each MGPS is run, for how long and any cleaning/maintenance requirements of the system once use is finished. This section should also include advice for ship operators on procedures for biofouling management if the MGPS is temporarily out of operation.

SAFETY PROCEDURES FOR THE SHIP AND THE CREW

Details of specific operational or safety restrictions, including those associated with the management system that affects the ship and/or the crew.

Details of specific safety procedures to be followed during ship inspections.

DISPOSAL OF BIOLOGICAL WASTE

This section should contain procedures for the disposal of biological waste generated by treatment or cleaning processes when the cleaning is conducted by, or under the direct supervision of, the shipowner, master or crew.

RECORDING REQUIREMENTS

This section should contain details of the types of documentation to be kept to verify the operations and treatments to be recorded in the Biofouling Record Book as outlined in appendix 2.

CREW TRAINING AND FAMILIARIZATION

This section should contain information on the provision of crew training and familiarization.

APPENDIX 2

BIOFOULING MANAGEMENT PLAN AND RECORD BOOK

Biofouling Record Book Form

Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species

Period From: To:

Name of Ship

Registration number*

Gross tonnage

Flag

* Registration number = IMO number and/or other registration numbers.

The ship is provided with a Biofouling Management Plan

Diagram of ship indicating underwater hull form (showing both side and bottom views of the ship, if necessary) and recognized biofouling niches:

1 Introduction

The Guidelines recommend that a Biofouling Record Book is maintained for each ship, in which should be recorded the details of all inspections and biofouling management measures undertaken on the ship.

2 Entries in the Biofouling Record Book

The following information should be recorded in the Biofouling Record Book:

2.1 After each dry-docking:

- a. Date and location that the ship was dry-docked.
- b. Date that ship was re-floated.
- c. Any hull cleaning that was performed while dry-docked, including areas cleaned, method used for cleaning and the location of dry-dock support blocks.
- d. Any anti-fouling coating system, including patch repairs, that was applied while dry-docked. Detail the type of anti-fouling coating system, the area and locations it was applied to, the coating thickness achieved and any surface preparation work undertaken (e.g., complete removal of underlying anti-fouling coating system or application of new anti-fouling coating system over the top of existing anti-fouling coating system).

- e. Name, position and signature of the person in charge of the activity for the ship.
- 2.2 When the hull area, fittings, niches and voids below the waterline have been inspected by divers:
- a. Date and location of ship when dive surveyed and reason for survey.
 - b. Area or side of the ship surveyed.
 - c. General observations with regard to biofouling (i.e. extent of biofouling and predominant biofouling types, e.g., mussels, barnacles, tubeworms, algae and slime).
 - d. What action was taken, if any, to remove or otherwise treat biofouling.
 - e. Any supporting evidence of the actions taken (e.g., report from the classification society or contractor, photographs and receipts).
 - f. Name, position, signature of the person in charge of the activity.
- 2.3 When the hull area, fittings, niches and voids below the waterline have been cleaned by divers:
- a. Date and location of ship when cleaning/treatment occurred.
 - b. Hull areas, fittings, niches and voids cleaned/treated.
 - c. Methods of cleaning or treatment used.
 - d. General observations with regard to biofouling (i.e. extent of biofouling and predominant biofouling types, e.g., mussels, barnacles, tubeworms, algae and slime).
 - e. Any supporting evidence of the actions taken (e.g., report from the classification society or contractor, photographs and receipts).
 - f. Records of permits required to undertake in-water cleaning if applicable.
 - g. Name, position and signature of the person in charge of the activity.
- 2.4 When the internal seawater cooling systems have been inspected and cleaned or treated:
- a. Date and location of ship when inspection and/or cleaning occurred.
 - b. General observations with regard to biofouling of internal seawater cooling systems (i.e. extent of biofouling and predominant biofouling types, e.g., mussels, barnacles, tubeworms, algae, slime).
 - c. Any cleaning or treatment undertaken.
 - d. Methods of cleaning or treatment used.

- e. Any supporting evidence of the actions taken (e.g., report from the classification society or contractor, photographs and receipts).
 - f. Name, position and signature of the person in charge of the activity.
- 2.5 For ships with a MGPS fitted:
- a. Records of operation and maintenance (such as regularly monitoring the electrical and mechanical functions of the systems).
 - b. Any instances when the system was not operating in accordance with the biofouling management plan.
- 2.6 Periods of time when the ship was laid up/inactive for an extended period of time:
- a. Date and location where ship was laid up.
 - b. Date when ship returned to normal operations.
 - c. Maintenance action taken prior to and following the period laid up.
 - d. Precautions taken to prevent biofouling accumulation (e.g., sea chests blanked off).
- 2.7 Periods of time when ship operating outside its normal operating profile:
- a. Duration and dates when ship not operating in accordance with its normal operating profile.
 - b. Reason for departure from normal operating profile (e.g., unexpected maintenance required).
- 2.8 Details of official inspection or review of ship biofouling risk (for ships arriving internationally, if applicable):
- a. Date and location of ship when inspection or review occurred.
 - b. Port State authority conducting the inspection/review and details of procedures followed or protocol adhered to and inspector/s involved.
 - c. Result of inspection/review.
 - d. Name, position, signature of the person in charge of the activity for the ship.
- 2.9 Any additional observations and general remarks:
- a. Since the ship was last cleaned, has the ship spent periods of time in locations that may significantly affect biofouling accumulation (e.g., fresh water, high latitude (Arctic and Antarctic) or tropical ports).

Record of Biofouling Management Actions

SAMPLE BIOFOULING RECORD BOOK PAGE

Name of Ship:

Registration number:

Date	Item (number)	Record of management actions	Signature of officers in charge

Signature of master

ANNEX 7

DRAFT AMENDMENTS TO THE NO_x TECHNICAL CODE 2008

1 Existing paragraph 2.2.4 is replaced as follows:

"2.2.4 *Engines not pre-certified on a test bed*

- .1 There are engines which, due to their size, construction and delivery schedule, cannot be pre-certified on a test bed. In such cases, the engine manufacturer, shipowner or shipbuilder shall make application to the Administration requesting an on board test (see 2.1.2.2). The applicant must demonstrate to the Administration that the on board test fully meets all of the requirements of a test-bed procedure as specified in chapter 5 of this Code. In no case shall an allowance be granted for possible deviations of measurements if an initial survey is carried out on board a ship without any valid pre-certification test. For engines undergoing an on board certification test, in order to be issued with an EIAPP Certificate, the same procedures apply as if the engine had been pre-certified on a test bed, subject to the limitations given in paragraph 2.2.4.2.
- .2 This pre-certification survey procedure may be accepted for an Individual Engine or for an Engine Group represented by the Parent Engine only, but it shall not be accepted for an Engine Family certification."

2 Paragraph 2.2.5.1 is amended as follows:

- ".1 Where a NO_x reducing device is to be included within the EIAPP certification, it must be recognized as a component of the engine, and its presence shall be recorded in the engine's Technical File. The engine shall be tested with the NO_x-reducing device fitted unless, due to technical and practical reasons, the combined testing is not appropriate and the procedures specified in paragraph 2.2.4.1 cannot be applied, subject to approval by the Administration. In the latter case the applicable test procedure may be performed and the combined engine/NO_x-reducing device may be approved and pre-certified by the Administration taking into account the SCR guidelines [(MEPC...(62))]. However, this pre-certification is subject to the limitations given in paragraph 2.2.4.2."

ANNEX 8

DRAFT MEPC RESOLUTION

GUIDELINES ADDRESSING ADDITIONAL ASPECTS TO THE NO_x TECHNICAL CODE 2008 WITH REGARD TO PARTICULAR REQUIREMENTS RELATED TO MARINE DIESEL ENGINES FITTED WITH SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEMS

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee (the Committee) conferred upon it by international conventions for the prevention and control of marine pollution,

RECALLING ALSO that, at its fifty-eighth session, the Committee adopted, by resolution MEPC.176(58), a revised MARPOL Annex VI (hereinafter referred to as "MARPOL Annex VI") and, by resolution MEPC.177(58), a revised Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines (hereinafter referred to as "the NO_x Technical Code 2008"),

NOTING regulation 13 of MARPOL Annex VI which makes the NO_x Technical Code 2008 mandatory under that Annex,

NOTING ALSO the use of NO_x-reducing devices is envisaged in the NO_x Technical Code 2008 and selective catalytic reduction systems (hereinafter referred to as "SCR systems") are such NO_x-reducing devices for compliance with Tier III NO_x limit,

HAVING CONSIDERED, at its [sixty-second] session, the guidelines addressing additional aspects to the NO_x Technical Code 2008 with regard to particular requirements related to marine diesel engines fitted with SCR systems, proposed by the Sub-Committee on Bulk Liquids and Gases at its fifteenth session,

1. ADOPTS the Guidelines addressing additional aspects to the NO_x Technical Code 2008 with regard to particular requirements related to marine diesel engines fitted with Selective Catalytic Reduction (SCR) Systems, as set out at annex to the present resolution;
2. INVITES Administrations to take the annexed Guidelines into account when certifying engines fitted with SCR systems;
3. REQUESTS the Parties to MARPOL Annex VI and other Member Governments to bring the annexed Guidelines related to the NO_x Technical Code to the attention of shipowners, ship operators, shipbuilders, marine diesel engine manufacturers and any other interested groups;
4. AGREES to keep these Guidelines under review in light of the experience gained.

ANNEX

**GUIDELINES ADDRESSING ADDITIONAL ASPECTS TO THE NO_x TECHNICAL
CODE 2008 WITH REGARD TO PARTICULAR REQUIREMENTS RELATED TO MARINE
DIESEL ENGINES FITTED WITH SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEMS**

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1 INTRODUCTION

1.1 The use of NO_x-reducing devices is envisaged in the NO_x Technical Code 2008 (NTC 2008) as given in section 2.2.5 and a Selective Catalytic Reduction (SCR) system is one of such devices.

1.2 NTC 2008 contains two ways for pre-certification of engine systems fitted with NO_x-reducing devices:

- .1 engine fitted with SCR: Approval in accordance with paragraph 2.2.5.1 of the NTC 2008. Test according to chapter 5 of the NTC 2008; and
- .2 the simplified measurement method in accordance with section 6.3 of the NTC 2008 as regulated in paragraph 2.2.5.2 (Primary failure case) of the NTC 2008.

1.3 According to paragraph 2.2.5.1 of the NTC 2008 the engine system fitted with SCR shall be tested on a test bed (Scheme A). Where that is not appropriate, given reasons as outlined under paragraph 3.1.1 of these guidelines; the provisions of Scheme B as set out in these guidelines should be applied.

1.4 Administrations are invited to take these guidelines into account when certifying engines fitted with SCR.

2 GENERAL

2.1 Purpose

2.1.1 The purpose of these guidelines is to provide guidance in addition to the requirements of the NTC 2008 for design, testing, surveys and certification of marine diesel engines fitted with an SCR system to ensure its compliance with the requirements of regulation 13 of MARPOL Annex VI.

2.2 Application

2.2.1 These guidelines apply to marine diesel engines fitted with SCR for compliance with regulation 13 of MARPOL Annex VI.

2.3 Definitions

2.3.1 Unless provided otherwise, the terms in these guidelines have the same meaning as the terms defined in regulation 2 of MARPOL Annex VI and in section 1.3 of the NTC 2008.

2.3.2 "Engine system fitted with SCR" means a system consisting of a marine diesel engine, an SCR chamber and a reductant injection system. When a control device on NO_x-reducing performance is provided, it is also regarded as a part of the system.

2.3.3 "Catalyst block" means a block of certain dimension through which exhaust gas passes and which contains catalyst composition on its inside surface to reduce NO_x from exhaust gas.

2.3.4 "SCR chamber" means an integrated unit, which contains the catalyst block(s), and into which flows exhaust gas and reductant.

2.3.5 "Reductant injection system" means a system, which consists of the pump(s) to supply reductant to the nozzle(s), the nozzle(s) spraying reductant into the exhaust gas stream and control device(s) of the spray.

2.3.6 "AV (area velocity) value" means a value of the exhaust gas flow rate passing through the catalyst blocks (m^3/h) per total active surface area of the catalyst blocks in the SCR chamber (m^2). Therefore, unit of AV value is (m/h). The exhaust gas flow volume is the volume defined at 0°C and 101.3 kPa.

2.3.7 "SV (space velocity) value" means a value of the exhaust gas flow rate passing through the catalyst block(s) (m^3/h) per total volume of the catalyst block(s) in the SCR chamber (m^3). Therefore, unit of SV value is (1/h). The exhaust gas flow volume is the volume defined at 0°C and 101.3 kPa.

2.3.8 "Total volume of the catalyst block" means the volume (m^3) based on outer dimensions of the catalyst block.

2.3.9 "LV (linear velocity) value" means a value of the exhaust gas flow rate passing through the catalyst blocks (m^3/h) per catalyst block's section (m^2) in a normal direction of exhaust gas flow. Therefore, unit of LV value is (m/h). The exhaust gas flow volume is the volume defined at 0°C and 101.3 kPa.

2.3.10 "Block section" means the cross-sectional area (m^2) of the catalyst block based on the outer dimensions.

2.3.11 "NO_x reduction rate η " means a value deriving from the following formula. Unit of η is (%):

$$\eta = \frac{(C_{inlet} - C_{outlet})}{C_{inlet}} \cdot 100$$

Where: C_{inlet} is NO_x concentration (ppm) as measured at the inlet of the SCR chamber;
 C_{outlet} is NO_x concentration (ppm) as measured at the outlet of the SCR chamber.

3 PRE-CERTIFICATION PROCEDURE

3.1 General

3.1.1 Engine systems fitted with SCR should be certified in accordance with chapter 2 of the NTC 2008. In cases where combined engine/SCR systems can neither be tested on a test bed due to their size, construction and other restrictions nor an on board test can be performed fully complying with the requirements of chapter 5 of the NTC 2008 the procedures provided by Scheme B of these guidelines should be applied.

3.1.2 The applicant for certification should be the entity responsible for the complete system "Engine system fitted with SCR", e.g., the engine manufacturer.

3.1.3 The applicant should supply all necessary documentation, including the Technical File for the complete system, a description of the required on board NO_x verification procedure and, where applicable, the description of the confirmation test procedure.

3.2 Technical File and on board NO_x verification procedures

3.2.1 In addition to the information supplied in paragraph 3.1.3 of these guidelines and items in section 2.4 of the NTC 2008, engine systems fitted with SCR should include the following information in its Technical File:

- .1 reductant: component/type and concentration;
- .2 reductant injection system including critical dimensions and supply volume;
- .3 design features of SCR specific components in the exhaust duct from the engine exhaust manifold to the SCR chamber;
- .4 catalyst block specification and arrangement in the SCR chamber;
- .5 inlet parameters including allowable exhaust gas temperature (maximum and minimum) at the inlet of the SCR chamber;
- .6 cross-unit parameters: allowable pressure loss (Δp) between inlet and outlet of SCR chamber and in the exhaust duct caused by SCR components;
- .7 aspects related to the fuel oil quality resulting in continued compliance of the engine with the applicable NO_x emission limit;
- .8 factors related to the deterioration rate of SCR performance, e.g., exchange condition for SCR blocks and recommended exchange time of SCR blocks;
- .9 controlling arrangements and settings of the SCR, e.g., model, specification of control device;
- .10 measures to minimize reductant slip;
- .11 parameter check method as the verification procedure: with regard to the application of the parameter check method, requirements given in paragraph 2.3.6 of the NTC 2008 and guidance given in appendix VII, paragraph 2 of the NTC 2008 should be taken into account in assessing the adequacy of a proposed procedure with analysers meeting or exceeding the requirements of appendix III of the NTC 2008; and
- .12 any other parameter(s) specified by the manufacturer.

3.3 Measures to minimize reductant slip

2.3.1 When SCR uses urea solution, ammonia solution or ammonia gas as reductant, measures to prevent reductant slip should be provided to avoid the supply of an excessive amount of reductant in the system. The reductant injection system should be designed to prevent emissions of any harmful substance from the system.

3.4 Pre-certification procedure

3.4.1 Test and pre-certification of an engine system fitted with SCR should be conducted either by Scheme A (as given in section 5 of these guidelines), or by Scheme B (as given in sections 6 and 7 of these guidelines), as appropriate.

3.5 EIAPP certificate

3.5.1 An Engine International Air Pollution Prevention (EIAPP) Certificate (see appendix I of the NTC 2008) should be issued by the Administration after approval of the Technical File.

3.5.2 When an applicant chooses the Scheme B for pre-certification, the IAPP initial survey should not be completed until the on board initial confirmation test provides compliant results. The applicant remains the responsible entity until final acceptance of the system.

4 FAMILY AND GROUP CONCEPTS FOR ENGINE SYSTEMS FITTED WITH SCR

4.1 Requirements in chapter 4 of the NTC 2008 apply equally to engine systems fitted with SCR.

5 TEST PROCEDURES FOR SCHEME A

5.1 General

5.1.1 A test for a combined system of an engine fitted with an SCR in Scheme A is to ensure compliance with the applicable NO_x emission limits of MARPOL Annex VI, as required. The test bed measurement procedures of chapter 5 of the NTC 2008 should apply.

5.2 Calculation of gaseous emissions

5.2.1 The calculation method in section 5.12 of the NTC 2008 is also applied to engine systems fitted with SCR. No allowance is made for the reductant solution injected into the exhaust gas stream in respect of its effect on exhaust gas mass flow rate calculation (appendix VI) or dry/wet correction factor (equation (11), paragraph 5.12.3.2.2 of the NTC 2008). The NO_x correction factor for humidity and temperature (equations (16) or (17), paragraphs 5.12.4.5 and 5.12.4.6, respectively, of the NTC 2008) should not be applied.

5.2.2 For an engine system fitted with SCR, the following parameters should be measured and recorded in the engine test report in accordance with section 5.10 of the NTC 2008:

- .1 injection rate of reductant at each load point (kg/h);
- .2 exhaust gas temperature at the inlet and outlet of the SCR chamber (°C);
- .3 pressure loss (kPa): it is necessary to measure the pressure at inlet and at outlet of the SCR chamber and to calculate pressure loss Δp . If the manufacturer sets an allowable limit of Δp , it should be confirmed; and
- .4 other parameter(s) as specified by the Administration.

6 TEST PROCEDURES FOR SCHEME B

6.1 General

6.1.1 A test for an engine system fitted with SCR in Scheme B is to ensure that the system complies with the applicable NO_x emission limits in MARPOL Annex VI, as required. The test procedures in Scheme B are as follows:

- .1 an engine is tested to obtain the NO_x emission value (g/kWh) in accordance with paragraph 6.2.1 of these guidelines;

- .2 the SCR NO_x reduction rate may be calculated by modelling tools, taking into account geometrical reference conditions, chemical NO_x conversion models as well as other parameters to be considered;
- .3 an SCR chamber, not necessarily to full scale, is to be tested in accordance with section 6.3 of these guidelines in order to generate data for the calculation model as that used in paragraph 6.1.1.2 of these guidelines;
- .4 the NO_x emission from the engine system fitted with SCR, which is calculated in accordance with section 6.4 of these guidelines using the NO_x emission value from the engine and the NO_x reduction rate of SCR chamber. At this point the Technical File will be completed and this NO_x emission value will be entered into the supplement of the EIAPP certificate; and
- .5 the NO_x emission performance of the engine combined with the SCR is verified by a confirmation test in accordance with the procedure in paragraph 7.5 of these guidelines.

6.2 Verification test procedures for an engine

6.2.1 The purpose of the test of an engine is to establish the emission values for use in section 6.4 of these guidelines. These measurements should be in accordance with chapter 5 of the NTC 2008.

6.2.2 Paragraph 5.9.8.1 of the NTC 2008 requires engine conditions to be measured at each mode point, for an engine system with SCR. Additionally, exhaust gas temperature at the intended inlet of the SCR chamber should be determined and recorded in the test report as required by section 5.10 of the NTC 2008.

6.3 Test procedures for SCR chambers

6.3.1 General

6.3.1.1 The SCR chamber for validation testing may be either a full scale SCR chamber or a scaled version. A SCR chamber should demonstrate the reduction in NO_x concentrations (ppm) expected in exhaust gas measured in section 6.2 of these guidelines. Therefore, NO_x reduction rate of the SCR chamber should be determined for each individual mode point. Where undertaken on a scaled version of the SCR chamber the scaling process should be validated to the satisfaction of the Administration.

6.3.2 Test conditions at each mode point

6.3.2.1 Exhaust gas, catalyst, reductant and an injection system should satisfy the following conditions at each mode point:

- .1 Exhaust gas flow
Exhaust gas flow rate for the test should be scaled accordingly to account for the dimension of the catalyst model.
- .2 Exhaust gas component
Exhaust gas for the test should either be diesel engine exhaust gas or simulated gas.

Where diesel exhaust gas is used it should correspond, in terms of concentrations, to the exhaust gas in section 6.2 of these guidelines, in terms of NO_x, O₂, CO₂, H₂O, and SO₂ (±5% of the required concentration for each emission species).

Where simulated gas is used it should correspond, in terms of concentrations, to the exhaust gas in section 6.2 of these guidelines, in terms of NO, NO₂, O₂, CO₂, H₂O, and SO₂ (±5% of the required concentration for each emission species) balance N₂.

.3 Exhaust gas temperature

The temperature of exhaust gas used for the test should correspond to the temperatures obtained from testing in section 6.2 of these guidelines, ensuring that the SCR chamber is activated at every load point and that no ammonia bisulphate formation, or reductant destruction, takes place.

.4 Catalyst blocks and AV,SV value

The catalyst blocks used in the test should be representative of the catalyst blocks to be used in the SCR chamber in service. AV,SV or LV value should, in the case of full scale tests, be within a range of ±20% of the required value as obtained in testing from section 6.2 of these guidelines. In the case of scaled tests it should correspond to the above.

.5 Reductant

The reductant concentration should be representative of the reductant concentration in the exhaust gas during actual operation.

6.3.3 Stability for measurement

6.3.3.1 All measurements should be recorded after they have stabilized.

6.3.4 List of data to be derived from the model

6.3.4.1 Operating data which is to be given in the Technical File should be derived from the modelling process or otherwise justified.

6.3.4.2 Exhaust gas analysers should be in accordance with appendix III and appendix IV of the NTC 2008 or otherwise to the satisfaction of the Administration.

6.3.5 Test report for SCR chamber

6.3.5.1 Data recorded under paragraph 6.3.1.1 of these guidelines should be recorded in the test report as required by section 5.10 of the NTC 2008.

6.4 Calculation of the specific emission

6.4.1 The NO_x emission value of the engine system fitted with SCR should be calculated as follows:

$$\text{gas}_x = \frac{\sum_{i=1}^{i=n} (\eta_i \cdot q_{\text{mgas}_i} \cdot W_{F_i})}{\sum_{i=1}^{i=n} (P_i \cdot W_{F_i})}$$

Where: η_i = NO_x reduction rate (%) derived in accordance with section 6.3 of these guidelines;
 q_{mgas_i} = Mass flow of NO_x gas measured in accordance with section 6.2 of these guidelines;
 W_{F_i} = Weighting factor;
 P_i = Measured power at individual mode points in accordance with section 6.2 of these guidelines.

The weighting factors and number of modes (n) used in above calculation shall be according to the provisions of section 3.2 of the NTC 2008.

6.4.2 The NO_x emission value (g/kWh) calculated in accordance with paragraph 6.4.1 of these guidelines should be compared to the applicable emission limit. This emission value is entered into 1.9.6 of the Supplement to the EIAPP certificate (appendix I of the NTC 2008).

6.5 Test report to be submitted to the Administration

6.5.1 The test report referenced under paragraphs 6.2.2 and 6.3.5.1 of these guidelines, together with the data from section 6.4 of these guidelines should be consolidated into the overall documentation to be submitted to the Administration.

7 ON BOARD CONFIRMATION TEST FOR SCHEME B

7.1 After installation on board of an engine system fitted with SCR and before entry into service an initial confirmation test should be performed on board.

7.2 The engine system fitted with the SCR should be verified as corresponding to the description given in the Technical File.

7.3 The confirmation test should be undertaken as close as possible to 25%, 50% and 75% of rated power, independent of test cycle.

7.4 At each mode point of the confirmation test the operating values as given in the Technical File should be verified.

7.5 NO_x emission concentrations should be measured at the inlet and outlet of the SCR chamber. The NO_x reduction rate should be calculated. Both values should either be dry or wet. The value obtained for NO_x reduction rate should be compared to the initial confirmation test required value at each mode point as given in the Technical File. Reduction efficiency values obtained at each of the test points should not be less than the corresponding values as given in the Technical File by more than 5%.

7.6 The NO_x analyser should meet the requirements of chapter 5 of the NTC 2008.

[7.7 When an engine system fitted with SCR is in a group defined in chapter 4 of these guidelines, the confirmation test should be conducted only for the parent engine system of the group.]

ANNEX 9

DRAFT MEPC RESOLUTION

GUIDELINES FOR RECEPTION FACILITIES UNDER MARPOL ANNEX VI

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee (the Committee) conferred upon it by international conventions for the prevention and control of marine pollution,

RECALLING ALSO that, at its fifty-eighth session, the Committee adopted, by resolution MEPC.176(58), a revised MARPOL Annex VI (hereinafter referred to as "MARPOL Annex VI") which includes mandatory provisions that Ozone Depleting Substances and equipment containing such substances be delivered to appropriate reception facilities when removed from ships,

NOTING that regulation 17 of MARPOL Annex VI specifies two types of wastes that Parties must ensure the provision of reception facilities for ships calling at their ports,

NOTING ALSO that adequate MARPOL Annex VI reception facilities shall meet the needs of ships calling at a port or terminal without causing undue delay,

HAVING CONSIDERED, at its [sixty-second] session, the guidelines for reception facilities under MARPOL Annex VI, proposed by the Sub-Committee on Bulk Liquids and Gases at its fifteenth session,

1. ADOPTS the Guidelines for reception facilities under MARPOL Annex VI, as set out at annex to the present resolution;
2. INVITES Administrations to take the annexed Guidelines into account when developing and enacting national laws which give force to and implement provisions set forth in regulation 17 of MARPOL Annex VI;
3. REQUESTS the Parties to MARPOL Annex VI and other Member Governments to bring the annexed Guidelines to the attention of port and terminal operators and ship repair ports, and ship breaking facilities and any other interested groups;
4. AGREES to keep these Guidelines under review in light of the experience gained.

ANNEX

GUIDELINES FOR RECEPTION FACILITIES UNDER MARPOL ANNEX VI

1 INTRODUCTION

1.1 The main objectives of these Guidelines are to:

- .1 assist Governments in developing and enacting domestic laws which give force to and implement provisions set forth in regulation 17, Reception Facilities, of MARPOL Annex VI;
- .2 assist port and terminal operators and ship repair ports, and ship breaking facilities in assessing the need for and providing adequate reception facilities for Ozone Depletion Substances (ODS) and equipment containing ODS; and
- .3 assist port and terminal operators in assessing the need for, and providing adequate reception facilities for exhaust gas cleaning residues.

1.2 Adequate MARPOL Annex VI reception facilities shall meet the needs of ships calling at a port or terminal without causing undue delay.

1.3 MARPOL Annex VI, regulation 17 specifies two types of wastes that Parties must ensure the provision of reception facilities for ships calling at their ports:

- .1 Ozone Depleting Substances are those defined in MARPOL Annex VI, regulation 2.16; and
- .2 Exhaust gas cleaning residues are ship-generated residues that may range from liquid to solid.

2 DEFINITIONS

With reference to regulation 17 of MARPOL Annex VI:

2.1 *Remotely located port or terminal* means a port or terminal as informed to the Organization under regulation 17.2 of MARPOL Annex VI.

2.2 *Manage and process* means actions related to the collection, storage, transport, treatment and disposal of ODS and/or exhaust gas cleaning residues such that they are rendered in a safe and environmentally benign condition in accordance with best available practices.

2.3 *Appropriate action* means those actions taken by informed Parties to communicate to ships under their control that the advised ports cannot handle certain ODS and/or exhaust gas cleaning residues and those actions ships will need to take necessary to manage or process those substances in an alternative manner. Such alternatives could include arranging for collection before or after visiting the affected port, and in the latter case, ensuring adequate on board storage exists for those substances.

2.4 *EGCS residues* are a product of the water treatment process. The residue can be formed and removed from the water with different treatment techniques. Such residues contain sulphates, ash/soot, metals and hydrocarbons removed from the water.

2.5 ODS and equipment containing ODS are as defined in regulation 2.16 and equipment as referred to in regulation 12.4.

3 GENERAL REQUIREMENTS FOR MARPOL ANNEX VI RECEPTION FACILITIES

3.1 Treatment and disposal of ODS and EGCS residues

Taking into consideration its own local and national environmental laws and regulations as well as applicable international regulations and treaties, a Party should adopt strategies for collection, storage, transport, treatment and disposal of ODS and EGCS residues. Strategies for managing MARPOL Annex VI wastes should be safe and environmentally benign and based on industry best practices and best available technologies, and taking into account the local infrastructure. Parties are highly encouraged to make regular updates to the availability of Annex VI reception facilities in the Global Integrated Shipping Information System (GISIS) at: <http://gisis.imo.org/Public/>.

3.2 Composition of EGCS residues

Residues may contain sulphates, ash/soot, metals and hydrocarbons removed from the wash water. Specifically it may contain sulphite salts (CaSO_x) and may also include other metal sulphites (NaSO_x and KSO_x) and metal oxides and including Vanadium (V), Nickel (Ni), Magnesium (Mg), Aluminium (Al), Iron (Fe), and Silicon (Si).

3.3 Training/certification of personnel

Taking into consideration its own local and national laws and regulations Parties should ensure that personnel who process ODS have been properly trained in all personal protective measures to ensure safe handling of such materials and prevent the release of ODS to the atmosphere. Administrations should develop a certification system whereby letters or certificates are issued to qualified shore side personnel attesting to proper training for handling ODS and equipment containing ODS and operating disposal equipment. Such equipment should comply with rigorous standards for operation and be certified and/or approved.

3.4 Sufficient capacity for the throughput of trade and the likely volumes to be handled

Parties should undertake to evaluate the types and capacities of ships using their ports and terminals to determine the quantities of ODS and EGCS residues likely to be generated. Parties should ensure that ports and terminals have the capacity to collect and store, if necessary, ODS and EGCS residues from any and all ships that use its ports terminals. If capacity from several ports or terminals, including remotely located ports or terminals, is to be pooled then a Party should ensure that the capacity of such a pooled resource is sufficient for all facilities using it.

3.5 Provision of documentation for custody transfer from ship to reception facility

The Organization published MEPC.1/Circ.671, A Guide to Good Practice for Port Reception Facility Providers and Users. This user friendly guidance includes Appendix 2, MEPC.1/Circ.644, Advance Notification Form (ANF); and MEPC.1/Circ.645 Waste Delivery Receipt (WDR). These standard forms may be used by ship masters and port reception facility operators to document the transfer of wastes by type and quantity from ships to shore side reception facilities. When providing advanced notification to a port or terminal that Annex VI reception facilities will be required, the ANF may be used. Where reception facility

operators are required to provide to the ship a receipt for ODS and/or EGCS residues, the WDR may be used.

4 GENERAL REQUIREMENTS APPLICABLE WHEN MARPOL ANNEX VI RECEPTION FACILITIES ARE NOT AVAILABLE

4.1 Where reception facilities are not provided

Parties must notify the Organization in the event that a port or terminal cannot provide ODS or EGCS residue reception facilities. In addition Parties must notify the Organization where such facilities are, alternatively, provided. Parties are highly encouraged to make regular updates to the availability of Annex VI reception facilities in the Global Integrated Shipping Information System (GISIS) at: <http://gisis.imo.org/Public/>. Parties that inform the Organization of ports that cannot accept ODS or EGCS residues are encouraged to provide an explanation as to the specific reasons that necessitate such notification.

4.2 Use of regional/bi-lateral agreements

The concept of regional arrangements is encouraged as a possible alternative for ensuring adequacy of reception facilities. Parties could enter into a regional or bi-lateral arrangement with other Parties in a region that would provide reception facilities to ships travelling in the region. It has been recognized by the Organization that waste management planning on a regional basis and the establishment of regional arrangements can provide an alternative solution for ensuring that ships do not have an incentive to discharge waste into the environment, including the atmosphere, and that ports and terminals within a region can meet the requirements of regulation 17 of MARPOL Annex VI.

4.3 Alternative facilities (required to be reported in accordance with regulation 17.2)

A Party shall report to the Organization when any alternative arrangement is made by a port or terminal to provide ODS or EGCS residue reception facilities. Additionally, a Party shall report to the Organization where such adequate reception facilities are provided.

4.4 Criteria for those alternative measures for reception facilities

Criteria for those alternative measures for reception facilities should take into consideration the capacities required to meet the needs of ships calling in their region and without causing undue delay.

4.5 Alternative reception facilities

Alternative reception facilities should have an environmentally acceptable method for processing/handling MARPOL Annex VI wastes as outlined in paragraph 5.1.

5 GENERAL REQUIREMENTS FOR SHIPS USING PORTS WHERE RECEPTION FACILITIES ARE NOT AVAILABLE

5.1 Voyage planning and on board storage

Voyage planning should be part of any waste management planning strategy. Masters of ships should ensure that there is adequate on board capacity for storage of all ODS and EGCS residues that may be generated during the course of voyages which include visits to ports or terminals where reception facilities are not available.

5.2 Notifications (according to regulation 17.3)

The Guide to Good Practice for Port Reception Facility Providers and Users (MEPC.1/Circ.671) contains Appendix 1 Revised Consolidated Format for Reporting Alleged Inadequacy of Port Reception Facilities. This standard form may be used by ship masters to report MARPOL Annex VI reception facility inadequacy to the Organization and to the port State through their own flag State Administration.

ANNEX 10

DRAFT MSC CIRCULAR

**GUIDELINES ON TANK ENTRY FOR TANKERS USING NITROGEN
AS AN INERTING MEDIUM**

1 The Maritime Safety Committee at its [eighty-ninth session (11 to 20 May 2011)], having considered the proposal by the Sub-Committee on Bulk Liquids and Gases, at its fifteenth session, approved the Guidelines on tank entry for tankers using nitrogen as an inerting medium, set out in the annex.

2 Member Governments are invited to bring the annexed Guidelines to the attention of shipowners, ship operators and seafarers, urging them to apply the Guidelines, as appropriate, to all tankers using nitrogen as an inerting medium.

ANNEX

GUIDELINES ON TANK ENTRY FOR TANKERS USING NITROGEN AS AN INERTING MEDIUM

1 PURPOSE

The purpose of these Guidelines is to describe the procedures and minimum precautions, which are to be followed when personnel intend to enter a tank, in order to reduce the risk of asphyxiation after inerting the tanks by Nitrogen. These Guidelines should be used in conjunction with the Revised Recommendations for entering enclosed spaces aboard ships (resolution A.[...](27)).

2 USE OF NITROGEN

2.1 Nitrogen is a colourless and odourless gas that can cause oxygen deficiency in confined spaces, and at exhaust openings on deck, during purging of tanks and void spaces.

2.2 Nitrogen (N₂) is classified as a simple asphyxiate, meaning that it will displace oxygen in high concentrations and create an oxygen deficient (< 21%) atmosphere without any significant physiological effects. Breathing is stimulated and controlled by carbon dioxide (CO₂) present in the lungs. As the CO₂ level increases, the brain sends a message to increase respiration. When the CO₂ level drops, the rate of respiration will also decrease in order to maintain the proper balance.

2.3 Everyone should understand that one deep breath of 100% N₂ will be fatal. 100% N₂ will displace CO₂ and O₂ completely and, in the absence of a CO₂ signal to the brain, the stimulus to breath no longer exists.

3 PRE-PLANNING

3.1 Prior to entering a tank, all persons who are to be involved in the task should meet to:

- .1 define the purpose of entering the tank;
- .2 identify the steps to be taken to achieve the purpose;
- .3 develop a plan of action; and
- .4 assign responsibilities.

3.2 The meeting should address:

- .1 scheduling of manpower – may include the following:
 - .1 authorization: the master will be ultimately responsible for authorizing tank entry. An officer should be designated as the responsible person with sufficient knowledge of the procedures to be established and complied with on board, in order for ensuring that the correct procedures are observed;

- .2 the person undertaking the testing of the atmosphere should be trained in the use of the equipment. Only properly calibrated equipment should be used and the manufacturers' instructions should be strictly followed;
 - .3 *attendant* means a person who is suitably trained within the safety management system, maintains a watch over those entering the tank, maintains communications with those inside the tank and initiates the emergency procedures in the event of an incident occurring; and
 - .4 *tank rescue team* are any members of the crew trained in the use of rescue and resuscitation equipment;
- .2 tank washing;
 - .3 gas freeing;
 - .4 testing of the tank atmosphere;
 - .5 identifying and minimizing physical hazards;
 - .6 listing equipment needed, i.e. safety, fire fighting, communication, tools, escape and rescue;
 - .7 advising personnel who will enter the space of the hazards associated with the operation;
 - .8 maintaining safe conditions in the tank; and
 - .9 reviewing emergency procedures for rescue and fire fighting – may include the following:
 - .1 the person in charge of the rescue party should not enter the tank, but should coordinate the rescue operation from the tank access;
 - .2 in the event that a casualty must be removed from the tank, sufficient persons must be on deck and available to effect proper use of the rescue equipment;
 - .3 sufficient persons should be assigned to the tank rescue team. They should be familiar with the tank arrangement and trained in the use of the equipment and able to deliver first aid; and
 - .4 the decision to remove an injured person from the space must be based on the relative danger of his location and extent of his injuries, versus the danger of increasing his injuries by movement prior to effecting first aid.

4 INITIAL PREPARATION

4.1 Marking of cargo tanks

4.1.1 Tanks should be clearly marked to make it clear to all which are safe for entry and which must not be entered. Any tank where crew are working should be clearly marked as such.

4.1.2 Warning signs should also be posted at the gangway, and at other locations as deemed necessary by the master, when nitrogen is being produced on board or received from shore.

4.2 After a tank has been cleaned and ventilated, the following steps should be taken:

4.2.1 Ensure that the tank to be entered has been segregated from all other spaces which contain or may contain a non-gas free atmosphere. All common line valves should be lashed in the closed position and labelled.

4.2.2 Check that all cargo pipes in the tank being entered have been flushed and drained.

4.2.3 In addition to the safety equipment used for tank entry, rescue and resuscitation and fire-fighting equipment should be available, inspected and in proper working order. This may include the following:

- .1 equipment to be immediately available on deck:
 - .1 rescue hoist equipment to enable an injured person to be removed from the tank;
 - .2 self-contained breathing apparatus;
 - .3 oxygen meter;
 - .4 gas meter; and
 - .5 toxic gas detector;
- .2 equipment to be carried on board and readily available:
 - .1 stretchers;
 - .2 resuscitator;
 - .3 first-aid kit;
 - .4 fire hose with spray nozzle; and
 - .5 dry chemical and foam fire extinguishers;
- .3 equipment for each member of the tank entry party: flashlight and protective clothing; and
- .4 equipment to be carried by at least one member of the tank entry team: intrinsically safe two-way portable radiotelephone apparatus.

4.2.4 The attendant should stand by the tank entrance while people are in the tank. In addition, sufficient people to form a rescue team should be identified, readily available and should not be involved in the tank entry.

4.2.5 Establish a means of communication and emergency signals between the persons on deck and the persons in the tank. Ensure everybody understands these signals before tank entry and ensure that intrinsically safe two-way portable radiotelephone apparatus is available for the use of the attendant at the tank entrance.

5 TESTING THE ATMOSPHERE IN THE TANK

5.1 After a tank has been cleaned, ventilated and prepared for entry it should be tested for oxygen content, and finally, as appropriate, for toxic gases at various levels from top to bottom.

5.2 The atmosphere can only be accepted as suitable for entry when all the relevant hazards have been identified and removed.

5.3 Appropriate testing of the atmosphere of a tank should be carried out with properly calibrated equipment by persons trained in the use of the equipment. The manufacturers' instructions should be strictly followed. Testing of the tank should be carried out before any person enters the tank, and at regular intervals thereafter until all work is completed. Where appropriate, the testing of the tank should be carried out at as many different levels as is necessary to obtain a representative sample of the atmosphere in the tank. In some cases it may be difficult to test the atmosphere throughout the tank without entering the tank and this should be taken into account when assessing the risk to personnel entering the tank. The use of flexible hoses or fixed sampling lines which reach remote areas within the tank, may allow for safe testing without having to enter the tank.

5.4 All ventilation must be stopped prior to and during the atmosphere tests and resumed prior to any person entering the tank.

5.5 Criteria for Tank Entry

5.5.1 For entry purposes, steady readings of all the following should be obtained:

- .1 21% oxygen by volume by oxygen content meter*;
- .2 not more than 1% of lower flammable limit (LFL) on a suitably sensitive combustible gas indicator, where the preliminary assessment has determined that there is potential for flammable gases or vapours; and
- .3 not more than 50% of the occupational exposure limit (OEL) of any toxic vapours and gases**.

5.5.2 A responsible person should ensure that all measuring instruments in use have been properly calibrated and are maintained in accordance with the respective manufacturer's instructions.

* National requirements may determine the safe atmosphere range.

** It should be noted that the term Occupational Exposure Limit (OEL) includes the Permissible Exposure Limit (PEL), Maximum Admissible Concentration (MAC) and Threshold Limit Value (TLV) or any other internationally recognized terms.

5.5.3 If these conditions cannot be met, additional ventilation should be applied to the tank and re-testing should be conducted after a suitable interval.

6 ADDITIONAL PRECAUTIONS FOR ENTRY INTO A TANK WHERE THE ATMOSPHERE IS KNOWN OR SUSPECTED TO BE UNSAFE

6.1 Tanks that have not been tested should be considered unsafe for persons to enter.

6.2 If the atmosphere in a tank is suspected or known to be unsafe, the tank should only be entered in the event of an emergency. The number of persons entering the tank should be the minimum compatible with the task to be performed.

6.3 Suitable breathing apparatus, e.g., of the air-line or self-contained type, should always be worn, and only personnel trained in its use should be allowed to enter the space. Air-purifying respirators should not be used.

6.4 Persons entering tanks should be provided with calibrated and tested personal multi-gas detectors that monitor the levels of oxygen, carbon monoxide and other gases, as appropriate. Rescue harnesses should be worn and, unless impractical, lifelines should be used. Appropriate protective clothing should be worn particularly where there is any risk of toxic substances or chemicals coming into contact with the skin or eyes of those entering the tank.

7 FINAL PREPARATION

The responsible person should ensure that:

- .1 all personnel involved understand the emergency procedures;
- .2 each person entering the tank is wearing the appropriate protective clothing and has the correct personal safety equipment;
- .3 all personnel involved understand the task to be undertaken; and
- .4 the equipment stated in paragraph 4.2.3 is readily available.

8 TANK ENTRY PERMIT

8.1 The relevant sections of the Tank Entry Permit (see appendix) should be filled in upon completion of preparations for tank entry. Entry permits may be made for multiple tank entries, however tanks which are not immediately entered should be re-tested and a new permit issued. At no time should a permit be granted for entry into more than six tanks.

8.2 The validity of an entry permit should not exceed 8 h.

9 TANK ENTRY

After the tank entry requirements have been met, the tank may be entered by the work party. While persons are working in the space, safe working conditions must be maintained. Particular attention should be given to the following:

- .1 the responsible person should ensure that the atmosphere is continuously monitored and order the evacuation of the space if the safe limits are exceeded or if there is any doubt about it at any stage of the operation;

- .2 ventilation must be provided during the entire period of the operation. Where necessary, portable ducting should be provided to ensure a good supply of air to the actual working area inside the space;
- .3 the responsible person should ensure that all identified risk mitigation measures are being enforced;
- .4 the attendant should be in continuous attendance at the entrance to the tank;
- .5 the responsible person should be aware of the location of every person in the tank at all times. The work party should stay together whenever possible;
- .6 safety harnesses should be worn at all times when working in tanks;
- .7 rescue equipment should be rigged and ready for use throughout the operation and persons assigned to the rescue party should be readily available; and
- .8 access openings should be kept open and clear for emergency exit at all times.

10 LEAVING THE TANK

10.1 If the tank is vacated for any reason, such as for a meal break, ventilation should continue during the break and the atmosphere of the tank should be re-tested and the provisions of paragraph 7 should be observed.

10.2 When finally leaving the tank, the responsible person should ensure that all persons in the work party are accounted for and that all tools and equipment have been removed from the tank.

APPENDIX

EXAMPLE OF AN ENCLOSED SPACE ENTRY PERMIT*

This permit relates to entry into any enclosed space and should be completed by the master or responsible person.

General		
Location/name of enclosed space		
Reason for entry		
This permit is valid	from: _____ hrs	Date
	to: _____ hrs	Date
		(See note 1)
Section 1 – Pre-entry preparation		
(To be checked by the master or nominated responsible person)		
	Yes	No
• Has the space been thoroughly ventilated by mechanical means?	"	"
• Has the space been segregated by blanking off or isolating all connecting pipelines or valves and electrical power/equipment?	"	"
• Has the space been cleaned where necessary?	"	"
• Has the space been tested and found safe for entry? (See note 2)	"	"
• Pre-entry atmosphere test readings:	By:	
- oxygen% vol (21%)**		
- hydrocarbon% LFL (less than 1%)		
- toxic gases ppm (less than 50% OEL of the specific gas)	Time:	
	(See note 3)	
• Have arrangements been made for frequent atmosphere checks to be made while the space is occupied and after work breaks?	"	"
• Have arrangements been made for the space to be continuously ventilated throughout the period of occupation and during work breaks?	"	"
• Are access and illumination adequate?	"	"

* It should be noted that this is a generic entry permit that may be used for all enclosed spaces on board all ships.
 ** Note that National requirements may determine the safe atmosphere range.

	Yes	No
• Is rescue and resuscitation equipment available for immediate use by the entrance to the space?	"	"
• Has an attendant been designated to be in constant attendance at the entrance to the space?	"	"
• Has the officer of the watch (bridge, engine-room, cargo control room) been advised of the planned entry?	"	"
• Has a system of communication between all parties been tested and emergency signals agreed?	"	"
• Are emergency and evacuation procedures established and understood by all personnel involved with the enclosed space entry?	"	"
• Is all equipment used in good working condition and inspected prior to entry?	"	"
• Are personnel properly clothed and equipped?	"	"

Section 2 – Pre-entry checks

(To be checked by each person entering the space)

	Yes	No
• I have received instructions or permission from the master or nominated responsible person to enter the enclosed space	"	"
• Section 1 of this permit has been satisfactorily completed by the master or nominated responsible person	"	"
• I have agreed and understand the communication procedures	"	"
• I have agreed upon a reporting interval of minutes	"	"
• Emergency and evacuation procedures have been agreed and are understood	"	"
• I am aware that the space must be vacated immediately in the event of ventilation failure or if atmosphere tests show a change from agreed safe criteria	"	"

Section 3 – Breathing apparatus and other equipment (To be checked jointly by the master or nominated responsible person and the person who is to enter the space)	Yes	No
• Those entering the space are familiar with any breathing apparatus to be used	"	"
• The breathing apparatus has been tested as follows: - gauge and capacity of air supply - low pressure audible alarm if fitted - face mask – under positive pressure and not leaking		
• The means of communication has been tested and emergency signals agreed	"	"
• All personnel entering the space have been provided with rescue harnesses and, where practicable, lifelines	"	"

Signed upon completion of sections 1, 2 and 3 by:

Master or nominated responsible person Date Time
 Attendant Date Time.....
 Person entering the space Date Time.....

Section 4 – Personnel entry (To be completed by the responsible person supervising entry)	
Names	
Time in	Time out
Section 5 – Completion of job (To be completed by the responsible person supervising entry)	
• Job completed	Date Time
• Space secured against entry	Date Time
• The officer of the watch has been duly informed	Date Time

Signed upon completion of sections 4 and 5 by:

Responsible person supervising entry Date Time

THIS PERMIT IS RENDERED INVALID SHOULD VENTILATION OF THE SPACE STOP OR IF ANY OF THE CONDITIONS NOTED IN THE CHECKLIST CHANGE
--

Notes:

- 1 The permit should contain a clear indication as to its maximum period of validity.

- 2 In order to obtain a representative cross-section of the space's atmosphere, samples should be taken from several levels and through as many openings as possible. Ventilation should be stopped for about 10 minutes before the pre-entry atmosphere tests are taken.
- 3 Tests for specific toxic contaminants, such as benzene or hydrogen sulphide, should be undertaken depending on the nature of the previous contents of the space.

ANNEX 11

PROPOSED CONSEQUENTIAL MODIFICATION TO SECTION 10.4 OF THE DRAFT REVISED RECOMMENDATIONS FOR ENTERING ENCLOSED SPACES ABOARD SHIPS

(Refer to annex 6 of document DSC 15/18)

The following footnote should be added to section 10.4:

10.4 Use of Nitrogen as an inert gas**

Nitrogen is a colourless and odourless gas that when used as an inert gas causes oxygen deficiency in enclosed spaces, and at exhaust openings on deck, during purging of tanks and void spaces and use in cargo holds. It should be noted that one deep breath of 100% nitrogen gas will be fatal.

** Refer to the Guidelines on tank entry for tankers using nitrogen as an inerting medium (MSC.1/Circ....).

ANNEX 12

PROPOSED AMENDMENTS TO CHAPTER 14 OF THE FSS CODE

(Refer to document BLG 14/16/1)

1 Paragraph 1.1 is amended as follows:

1.1 This chapter details the specification of fixed deck foam systems which are required to be provided by chapter II-2 of the Convention.

2 Paragraph 2.2.1.1 is replaced by the following:

"2.2.1.1 For tankers carrying:

- .1 crude oil or petroleum products having a flashpoint not exceeding 60°C (closed cup), as determined by an approved flashpoint apparatus, and a Reid vapour pressure which is below atmospheric pressure or other liquid products having a similar fire hazard, including cargoes in chapter 18 of the IBC Code, having a flashpoint not exceeding 60°C (closed cup) for which a regular foam fire-fighting system is effective (refer to SOLAS regulations II-2/1.6.1 and 10.8); or
- .2 petroleum products with a flashpoint exceeding 60°C (closed cup), as determined by an approved flashpoint apparatus (refer to SOLAS regulation II-2/1.6.4); or
- .3 IBC Code chapter 17 products with a flashpoint exceeding 60°C (closed cup) determined by an approved flashpoint apparatus (refer to paragraph 11.1.3 of the IBC Code and SOLAS regulation II-2/1.6.4),

the rate of supply of foam solution shall be not less than the greatest of the following:

- .1 0.6 //min per square metre of cargo tanks deck area, where cargo tanks deck area means the maximum breadth of the ship multiplied by the total longitudinal extent of the cargo tank spaces;
- .2 6 //min per square metre of the horizontal sectional area of the single tank having the largest such area; or
- .3 3 //min per square metre of the area protected by the largest monitor, such area being entirely forward of the monitor, but in no case should the output of any monitor be less than 1,250 //min."

3 Paragraph 2.2.1.2 is replaced by the following:

"2.2.1.2 For tankers carrying chemicals in bulk listed in chapter 17 of the IBC Code having a flashpoint not exceeding 60°C (closed cup), the rate of supply of foam solution shall be as required by the IBC Code."

4 The following new paragraph 2.2.1.5 is added after paragraph 2.2.1.4:

"2.2.1.5 Liquid cargoes with a flashpoint not exceeding 60°C for which a regular foam fire-fighting system is not effective shall comply with the provisions of SOLAS regulation II-2/1.6.2.1."

ANNEX 13

PROPOSED BIENNIAL AGENDA FOR THE 2012-2013 BIENNIUM IN SMART TERMS AND ITEMS TO BE PLACED ON THE COMMITTEE'S POST-BIENNIAL AGENDA THAT FALL UNDER THE PURVIEW OF THE SUB-COMMITTEE*

PROPOSED BIENNIAL AGENDA FOR 2012-2013 BIENNIUM

SUB-COMMITTEE ON BULK LIQUIDS AND GASES (BLG)					
PLANNED OUTPUTS 2012-2013 (resolution A.[...](27))		Parent organ(s)	Coordinating organ(s)	Involved organ(s)	Target completion year
Number**	Description				
1.1.2.2	Consideration of IACS unified interpretations	MSC/MEPC		BLG	Ongoing
2.0.1.13	Development of guidelines and other documents for uniform implementation of the 2004 BWM Convention	MEPC	BLG		2012
5.2.1.3	Development of international code of safety for ships using gases or other low flashpoint fuels	MSC	BLG	FP and DE	2012 2013
5.2.1.4	Development of revised Revision of the IGC Code	MSC	BLG	FP, DE, SLF and STW	2014 2013
5.2.1.25	Revision of the Recommendations for entering enclosed spaces aboard ships	MSC	DSC	BLG and FP	2011
5.2.1.31	Review of proposed amendments to chapter 14 of the FSS Code related to ships carrying liquid substances listed in the IBC Code	MSC	BLG	FP	2011

* Items printed in bold have been selected for the draft provisional agenda for BLG 16, as shown in annex 2. Struck-out text indicates proposed deletions and shaded text indicates proposed changes. Deleted outputs will be maintained in the report on the status of planned outputs.

** Numbers refer to the planned outputs for the 2010-2011 biennium.

SUB-COMMITTEE ON BULK LIQUIDS AND GASES (BLG)					
PLANNED OUTPUTS 2012-2013 (resolution A.[...](27))		Parent organ(s)	Coordinating organ(s)	Involved organ(s)	Target completion year
Number	Description				
5.2.2.9	Consideration of amendments to SOLAS to mandate enclosed space entry and rescue drills	MSC	DSC	BLG	2012
7.1.2.14	Development of international measures for minimizing the transfer of invasive aquatic species through biofouling of ships	MEPC	BLG		2012
7.1.2.32	Development of a Code for the transport and handling of limited amounts of hazardous and noxious liquid substances in bulk in offshore support vessels	MSC/MEPC	BLG	DE	2012 2013
7.2.2.4	Evaluation of safety and pollution hazards of chemicals and preparation of consequential amendments	MEPC	BLG		Ongoing
7.2.2.5	Application of the requirements for the carriage of bio-fuels and bio-fuel blends	MEPC	BLG		2011
7.3.1.1	Review of relevant non-mandatory instruments as a consequence of the amended MARPOL Annex VI and the NO_x Technical Code	MEPC	BLG		2012
12.3.1 12.1.2.2	Casualty analysis	MSC	FSI	BLG	Ongoing

ITEMS TO BE PLACED ON THE COMMITTEE'S POST-BIENNIAL AGENDA THAT FALL UNDER THE PURVIEW OF THE SUB-COMMITTEE

MARITIME SAFETY COMMITTEE								
ACCEPTED POST-BIENNIAL OUTPUTS				Parent organ(s)	Coordinating organ(s)	Associated organ(s)	Timescale (sessions)	References
No.	Reference to Strategic Directions	Reference to High-level Actions	Description					
1	5.2	5.2.1	Development of International Code of safety for ships using gases or other low flashpoint fuels	MSC	BLG	FP and DE	2014	BLG 15/19, section 6
2	5.2	5.2.1	Finalization of revised IGC Code	MSC	BLG	FP, DE, SLF and STW	2014	BLG 15/19, section 10

ANNEX 14

DRAFT PROVISIONAL AGENDA FOR BLG 16

- Opening of the session
- 1 Adoption of the agenda
 - 2 Decisions of other IMO bodies
 - 3 Evaluation of safety and pollution hazards of chemicals and preparation of consequential amendments
 - 4 Development of guidelines and other documents for uniform implementation of the 2004 BWM Convention
 - 5 Development of international measures for minimizing the transfer of invasive aquatic species through biofouling of ships
 - 6 Development of international code of safety for ships using gases or other low flashpoint fuels
 - 7 Development of revised IGC Code
 - 8 Review of relevant non-mandatory instruments as a consequence of the amended MARPOL Annex VI and the NO_x Technical Code
 - 9 Development of a Code for the transport and handling of limited amounts of hazardous and noxious liquid substances in bulk in offshore support vessels
 - 10 Consideration of amendment to SOLAS to mandate enclosed space entry and rescue drills
 - 11 Consideration of IACS unified interpretations
 - 12 Casualty analysis
 - 13 Biennial agenda and provisional agenda for BLG 17
 - 14 Election of Chairman and Vice-Chairman for 2013
 - 15 Any other business
 - 16 Report to the Committees

ANNEX 15

REPORT ON THE STATUS OF PLANNED OUTPUTS FOR THE 2010-2011 BIENNIUM

Planned output number in the High-level Action Plan for 2010-2011	Description	Target completion year	Parent organ(s)	Coordinating organ(s)	Associated organ(s)	Status of output for Year 1	Status of output for Year 2	References
1.1.2.2	Consideration of IACS unified interpretations	Continuous	MSC MEPC		BLG	Ongoing	Ongoing	BLG 15/19, section 8; MSC 78/26, paragraph 22.12
2.0.1.13	Development of guidelines and other documents for uniform implementation of the 2004 BWM Convention	2012	MEPC	BLG		In progress	In progress	BLG 15/19, section 5; MEPC 57/21, paragraph 18.11
5.2.1.3	Code of safety for ships using gas or other low-flash point fuels with properties similar to liquefied natural gas	2012	MSC	BLG		In progress	In progress	BLG 15/19, section 6; MSC 78/26, paragraph 24.11
5.2.1.4	Revision of the IGC Code	2014	MSC	BLG	FP, DE, SLF and STW	In progress	In progress	BLG 15/19, section 10; MSC 83/28, paragraph 25.7
5.2.1.5	Safety requirements for natural gas hydrate pellet carriers	2011	MSC	BLG		Completed	Completed	BLG 14/17, section 11; MSC 83/28, paragraph 25.6
5.2.1.25	Revision of the Recommendations for entering enclosed spaces aboard ships	2010	MSC	DSC	BLG, STW and FP	In progress	Completed	BLG 15/19, section 14; MSC 85/26, paragraph 23.4
5.2.2.9	Amendments to SOLAS to mandate enclosed space entry and rescue drills	2012	MSC	DSC	BLG	In progress	In progress	BLG 15/19, section 13; DSC 15/18, section 17; MSC 87/26, paragraph 24.11

Planned output number in the High-level Action Plan for 2010-2011	Description	Target completion year	Parent organ(s)	Coordinating organ(s)	Associated organ(s)	Status of output for Year 1	Status of output for Year 2	References
7.1.2.14	Development of international measures for minimizing the transfer of invasive aquatic species through biofouling of ships	2012	MEPC	BLG		In progress	In progress	BLG 15/19, section 9; MEPC 56/23, paragraph 19.12
7.3.1.1	Review of relevant non-mandatory instruments as a consequence of the amended MARPOL Annex VI and the NO _x Technical Code	2012	MEPC	BLG		In progress	In progress	BLG 15/19, section 11; MEPC 57/21, paragraph 18.11
7.1.2.32	Development of a Code for the transport and handling of limited amounts of hazardous and noxious liquid substances in bulk in offshore support vessels	2012	MSC MEPC	BLG	DE		In progress	BLG 15/19, section 12; MEPC 60/22, paragraph 19.3
7.2.2.4	Evaluation of safety and pollution hazards of chemicals and preparation of consequential amendments	Continuous	MEPC	BLG		Ongoing	Ongoing	BLG 15/19, section 3
7.2.2.5	Application of the requirements for the carriage of bio-fuels and bio-fuel blends	2011	MEPC	BLG		In progress	Completed	BLG 15/19, section 4; MEPC 55/23, paragraphs 19.4 and 19.5
12.3.1 12.1.2.2	Casualty analysis	Continuous	MSC	FSI		Ongoing	Ongoing	BLG 15/19, section 7; MSC 80/24, paragraph 21.6