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CONSTRUCTION
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REPORT TO THE MARITIME SAFETY COMMITTEE

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1 GENERAL

1.1 The Sub-Committee on Ship Design and Construction (SDC) held its first session from 20 to 24 January 2014 under the chairmanship of Mrs. A. Jost (Germany), who was unanimously elected as Chairman for 2014 at the opening of the session. Capt. N. Campbell (South Africa) was also unanimously elected as Vice-Chairman for 2014 at the opening of the session.

1.2 The session was attended by delegations from Member Governments and Associate Members of IMO; by representatives from United Nations and specialized agencies; by observers from intergovernmental organizations; and by non-governmental organizations in consultative status, as listed in document SDC 1/INF.1.

Opening address

1.3 The Secretary-General welcomed participants and delivered his opening address, the full text of which can be downloaded from the IMO website at the following link: <http://www.imo.org/MediaCentre/SecretaryGeneral/Secretary-GeneralsSpeechesToMeetings>

Chairman's remarks

1.4 In responding, the Chairman thanked the Secretary-General for his words of guidance and encouragement and assured him that his advice and requests would be given every consideration in the deliberations of the Sub-Committee.

Statement by the delegation of Japan

1.5 The Sub-Committee noted the statement by the delegation of Japan on the loss of the **MOL Comfort**, which was mentioned by the Secretary-General in his opening address. In this context, the Sub-Committee was informed that as the **MOL Comfort** builder, operator and classification society are all located in Japan and are able to closely share information and discuss safety measures, the Japanese government established a committee on large containership safety, in August 2013, composed of members from the maritime industry, experts with relevant knowledge and experience, and the related research institution staff. The interim report of this committee was issued in December 2013, with the intention to inform the industry, classification societies and IMO Member Governments about the safety measures discussed by the committee. The Sub-Committee noted that Japan plans to submit a document to MSC 93 and the first session of the Sub-Committee on Implementation of IMO Instruments (III 1), based on this interim report, together with the Bahamas as the flag State.

Adoption of the agenda and related matters

1.6 The Sub-Committee adopted the agenda (SDC 1/1/Rev.2) and agreed to be guided in its work, in general, by the annotations contained in document SDC 1/1/1 (Secretariat) and the working arrangements proposed in document SDC 1/1/2 (Secretariat). The agenda, as adopted, together with the list of documents considered under each agenda item, is set out in document SDC 1/INF.15.

2 DECISIONS OF OTHER IMO BODIES

2.1 The Sub-Committee noted the decisions and comments pertaining to its work made by FSI 21, STW 44, MEPC 65 and MSC 92, as reported in documents SDC 1/2 and SDC 1/2/1 (Secretariat), including the outcome of C 110 and A 28 as reported verbally by the Secretariat, and took them into account in its deliberations when dealing with the relevant agenda items.

2.2 The Sub-Committee also noted that the Council, at its 110th session, approved the Committees' proposal for full five-day sessions, with interpretation, for SDC 1 and the first session of the Sub-Committee on Navigation, Communications and Search and Rescue (NCSR), to enable them to cope with their heavy agendas; and also approved their decision to request the Secretariat to make the necessary changes to the IMODOCS website to reflect the new sub-committee structure, while also maintaining access to documents under the previous sub-committee structure.

2.3 The Sub-Committee further noted that the Assembly, at its twenty-eighth session, approved the *Strategic plan for the Organization (for the six-year period 2014 to 2019)* (resolution A.1060(28)) and the *High-level Action Plan and priorities for the 2014-2015 biennium* (resolution A.1061(28)).

3 DEVELOPMENT OF A MANDATORY CODE FOR SHIPS OPERATING IN POLAR WATERS

GENERAL

3.1 The Sub-Committee recalled that DE 57 re-established the Polar Code Correspondence Group and instructed it to further develop the draft Polar Code, based on the report of the correspondence group (DE 57/11/6), the report of the working group at DE 57 (DE 57/WP.6 and DE 57/WP.6/Add.1) and the report of DE 57 (DE 57/25), taking into account the outcome of the consideration of the relevant chapters by other IMO bodies; and prepare draft amendments to mandatory IMO instruments.

3.2 The Sub-Committee also recalled that FP 56 established a Correspondence Group on Development of a Mandatory Code for Ships Operating in Polar Waters, with terms of reference as set out in paragraph 20.12.4 of document FP 56/23, and instructed the group to submit a report to this session.

3.3 The Sub-Committee further recalled that SLF 55 instructed the Intact Stability (IS) and Subdivision and Damage Stability (SDS) Correspondence Groups to consider the proposed text of chapters 3 and 4 of the draft Polar Code, as contained in the annex to documents SLF 55/13 and DE 57/11, taking into account document SLF 55/13/1, and advise the Sub-Committee accordingly.

3.4 The Sub-Committee noted that MSC 92 had approved an Intersessional Working Group on the Polar Code, from 30 September to 4 October 2013, as concurrently approved by MEPC 65, with terms of reference as set out in paragraphs 11.45 and 11.46 of document DE 57/25, and instructed it to report directly to SDC 1 (see paragraph 3.12).

RUSSIAN RESEARCH SHIP **AKADEMIK SHOKALSKIY**

3.5 The Sub-Committee noted the statements made by the delegations of Australia and the Russian Federation regarding the incident involving the **Akademik Shokalskiy**, both of which are set out in annex 10.

REPORT OF THE CORRESPONDENCE GROUP ESTABLISHED AT FP 56

3.6 The Sub-Committee considered the report of the Correspondence Group on Development of a Mandatory Code for Ships Operating in Polar Waters established at FP 56 (SDC 1/3/5) and, having approved it in general, noted that the group agreed that SOLAS chapter II-2 and the FSS Code do not adequately address concerns and the effect of extreme low temperature on equipment in all cases and that there is a need to address them in the draft Polar Code. Having considered whether temperature ranges should be prescribed for systems and appliances, the Sub-Committee also noted that the group, in general, preferred a performance-based approach and did not support specifying temperature ranges or specific temperature values for the systems and appliances in the draft chapter 8 (Fire Safety/Protection) of the draft Polar Code.

3.7 Following consideration of the report of the correspondence group, the Sub-Committee agreed that document SDC 1/3/5 should be taken into account by the Polar Code Working Group, as appropriate.

REPORT OF THE CORRESPONDENCE GROUPS ESTABLISHED AT SLF 55**Report of the SDS Correspondence Group**

3.8 The Sub-Committee considered the report of the Correspondence Group on Subdivision and Damage Stability (SDS) established at SLF 55 (SDC 1/3/6) and, having approved it in general, noted that the report summarizes the work and recommendations of the SDS Correspondence Group regarding the development of chapters 3 (Ship Structures) and 4 (Stability and Subdivision) of the draft Polar Code.

3.9 In considering the report of the SDS Correspondence Group, the Sub-Committee, having noted the concerns expressed by some delegations regarding the requirements for category C ships, matters related to ice-strengthening and subdivision, the blanket application of provisions to all ships, and the need to take into account actual operating parameters of ships, agreed that the working group should consider, in particular, the concerns expressed in paragraphs 5, 6, 7, 9 and 11 of document SDC 1/3/6. In addition, the Sub-Committee agreed to refer the proposals related to chapters 3 and 4 of the draft Polar Code, as set out in the annex to document SDC 1/3/6, to the Polar Code Working Group for further consideration.

Report of the IS Correspondence Group

3.10 The Sub-Committee considered the report of the Correspondence Group on Intact Stability (IS) established at SLF 55 (SDC 1/5) and, having approved it in general, noted that the report summarizes the work of the group concerning the proposed text of chapters 3 and 4 of the draft Polar Code, as contained in the annex to document SLF 55/13, taking into account documents SLF 55/13/1 and DE 57/11. In this context, the Sub-Committee also noted that there was a general agreement in the correspondence group that ice accretion allowances should be retained in the 2008 IS Code and that the draft Polar Code should only seek to refer to them.

3.11 Having considered the report of the IS Correspondence Group, the Sub-Committee agreed to refer the text of chapters 3 and 4 of the draft Polar Code, as set out in annex 1 to document SDC 1/5, to the Polar Code Working Group for further consideration.

REPORTS OF THE INTERSESSIONAL WORKING AND CORRESPONDENCE GROUPS

General

3.12 The Sub-Committee considered the following documents:

- .1 SDC 1/3 (Norway), providing the report of the Intersessional Working Group on the Polar Code and presenting the text of the draft International Code of Safety for Ships Operating in Polar Waters (Polar Code); and
- .2 SDC 1/3/3 and SDC 1/INF.10 (Norway), providing the report of the correspondence group established at DE 57. The correspondence group continued the development of the draft Polar Code after DE 57 and submitted its report to the Intersessional Working Group on the Polar Code (ISWG PC/1). The outcome of the work of the intersessional working group was used as the basis for additional work in the correspondence group after the intersessional meeting. The group also prepared associated draft amendments to SOLAS and MARPOL in order to make the Polar Code mandatory.

3.13 The Sub-Committee, having thanked the members of the correspondence group and in particular the coordinator, Mrs. T. Stemre of Norway, for the enormous amount of work carried out, noted the progress made to date on the development of the draft Polar Code and the need for further discussions in the Polar Code Working Group.

Report of the intersessional working group

3.14 With regard to the outcome of the intersessional working group (SDC 1/3), the Sub-Committee, having approved the report in general, decided to only note the actions requested of it in paragraph 30 of document SDC 1/3 at this stage, taking into account that the Polar Code Working Group would further consider the report in detail.

Report of the correspondence group

3.15 With regard to the outcome of the correspondence group (SDC 1/3/3 and SDC 1/INF.10), the Sub-Committee approved the report in general and in particular:

- .1 agreed to forward chapters 10 (Safety of navigation) and 11 (Communication) to NCSR 1 for consideration, with a view to submitting any comments and proposals directly to MSC 94;
- .2 noted the proposal to merge the various operational chapters;
- .3 having noted the alternative proposals for chapter 13 (Crewing/manning), instructed the Polar Code Working Group to reduce the alternative proposals into one chapter and agreed to forward that chapter, once consolidated, to the first session of the Sub-Committee on Human Element, Training and Watchkeeping (HTW 1) for consideration, with a view to submitting any comments and proposals directly to MSC 93;
- .4 noted the draft amendments to SOLAS and MARPOL (see also paragraphs 3.18 to 3.43) and the proposal that any exemptions from the established applicability parameters in SOLAS and MARPOL should be included in the draft text of the Code; and

- .5 instructed the Polar Code Working Group to consider whether the words "of safety" should be in the title of the Code and advise the Sub-Committee accordingly.

3.16 In considering the reports of the intersessional working group and the correspondence group, the Sub-Committee, having noted concerns expressed by some delegations regarding the large number of vague phrases, the issuing of statutory certificates, the scope of application to the northern part of the Bering Sea, provisions that may conflict with other IMO conventions and matters related to construction standards for ships carrying noxious liquid substances, agreed to forward the above reports to the Polar Code Working Group for further consideration with a view to finalization of the Code, based on the text in document SDC 1/INF.10. In doing so, the Sub-Committee instructed the Polar Code Working Group to further consider matters related to the use of vague expressions (i.e. the word "sufficient"), the issuing of statutory certificates and noxious liquid substances, and advise the Sub-Committee accordingly.

3.17 Regarding matters related to geographical application, the Sub-Committee decided it would request the Committees to consider whether the Polar Code's scope of application should include the northern part of the Bering Sea, taking into account the statement by the Russian Federation as set out in annex 10. Consequently, the Polar Code Working Group was instructed not to consider this matter any further since this issue falls under the purview of the Committees.

DRAFT AMENDMENTS TO MARPOL ANNEXES I, II, IV AND V TO MAKE THE POLAR CODE MANDATORY

General

3.18 The Sub-Committee considered the proposed draft amendments to MARPOL Annexes I, II, IV and V to make the Polar Code mandatory (SDC 1/3/3, annex), as further modified by the Secretariat (SDC 1/WP.3, annex 2), consisting of the addition of definitions of "Polar Code" and "Polar waters" to the definition sections and the addition of a paragraph to the application provisions in the MARPOL Annexes to make the relevant chapters in part II-A of the draft Polar Code mandatory, according to the subject matters regulated under the various MARPOL Annexes.

3.19 In the ensuing discussion, the following views were, inter alia, expressed:

- .1 the text and the structure of the draft amendments were in line with the decisions of MEPC 63 and MSC 91 concerning how to make the Polar Code mandatory under SOLAS and MARPOL;
- .2 instead of amending the existing definition sections and application provisions in the MARPOL Annexes, an additional chapter entitled "International Code for ships operating in polar waters" could be added to each of the relevant Annexes, consisting of the definition of the Polar Code and its application, in order to make the relevant chapters in part II-A of the Code mandatory;
- .3 the requirements in part II-A of the Code should be incorporated directly into each of the relevant MARPOL Annexes, rather than by reference, in order to avoid significant legal uncertainty regarding how particular Polar Code regulations relate to existing MARPOL requirements; part II-A of the Code could reference the binding obligations located in the various

MARPOL Annexes, so that the Code would remain intact, but formally each requirement would take legal force within MARPOL; and incorporation of part II-A by reference would require significant edits and additions to the proposed amendments to MARPOL, as well as to the goals and functional requirements in part II-A of the Code, to avoid confusion; and

- .4 text for a new paragraph 8 of regulation 2 of MARPOL Annex I was proposed, to be repeated in the application sections of Annexes II, IV, and V, in order to clarify the relationship between the Polar Code, other international agreements and international law. In this regard, the delegation of Canada made a statement regarding the rights or obligations of States under international law as reflected in the 1982 United Nations Convention on the Law of the Sea (UNCLOS), the full text of which is set out in annex 10.

Text of the draft amendments

3.20 With regard to the definition of "Polar Code", the Sub-Committee agreed to include the text describing the mandatory or recommendatory nature of parts I-A, I-B, II-A and II-B of the Code in square brackets, and to replace the word "shall" contained in the text related to parts I-A and I-B with the word "should".

3.21 With regard to the proposal for an additional paragraph on application, the Sub-Committee agreed to delete the words ", as amended" at the end of the first sentence and the complete second sentence; and to add the words "environment-related provisions of the" before the word "introduction" in the first sentence.

3.22 Following discussion, the Sub-Committee agreed, in principle, to the draft amendments to MARPOL Annexes I, II, IV and V, as set out in annex 1, for submission to MEPC 66 for approval, with a view to subsequent adoption at MEPC 67, in conjunction with the adoption of the associated draft Polar Code (see paragraph 3.67), subject to the MEPC deciding on the text remaining in square brackets. In this connection, the Sub-Committee invited MEPC 66, in its deliberation of the draft amendments, to consider:

- .1 the need to resolve the application of part II-A of the Polar Code, in particular, with regard to existing and new ships' size and category, bearing in mind the different application requirements contained in MARPOL and SOLAS, including matters related to geographical application (see paragraphs 3.17 and 3.34);
- .2 the need to prepare consequential amendments to the certificates under MARPOL Annexes II and IV, in light of proposed new requirements in part II-A of the Code concerning tank separation distance for chemical tankers and the discharge of sewage in polar waters, pending the Committee's decision on the need for such new requirements and other provisions; and
- .3 the need to amend the exemption requirements and other provisions in the MARPOL Annexes, in order to cross reference them with the requirements of part II-A of the Code,

bearing in mind that the final texts of the SOLAS amendments should be aligned, as appropriate, with the associated amendments expected to be adopted to MARPOL (see paragraph 3.32).

Relaxation of the deadline for submissions to MEPC 66

3.23 With a view to expediting the finalization of the Polar Code and the associated amendments to MARPOL, and in accordance with paragraph 6.14 of the Committees' Guidelines, the Sub-Committee requested the Secretariat, in consultation with the Chairman of the MEPC, to relax the deadline for submitting documents of 4 pages or fewer, commenting on the outcome of the Sub-Committee with regard to Polar Code matters, by two weeks, i.e. to 21 February 2014.

DRAFT NEW CHAPTER XIV OF SOLAS

General

3.24 The Sub-Committee considered the proposed draft new chapter XIV of SOLAS to make the Polar Code mandatory (SDC 1/WP.3), containing definitions for the terms "Polar Code" and "Polar waters" which were similar to the MARPOL amendments, including provisions covering operational limitations and certification.

3.25 In the ensuing discussion, the following views were, inter alia, expressed:

- .1 the text and the structure of the draft amendments were in line with the decisions of MEPC 63 (MEPC 63/23, paragraph 11.14 to 11.16) and MSC 91 (MSC 91/22, paragraph 8.6) concerning how to make the Polar Code mandatory under SOLAS and MARPOL;
- .2 while some delegations expressed the view that the new SOLAS amendments should only be applicable to ships for which SOLAS chapter I applies, others expressed the view that the amendments should apply to all ships, irrespective of type and size; and
- .3 the new SOLAS chapter should take into account the different types of voyages for ships operating in Arctic waters versus those operating in Antarctic waters (i.e. domestic versus international voyages), including matters related to geographical application (see paragraph 3.17).

Text of the draft amendments

Definitions

3.26 As with the MARPOL amendments (see paragraph 3.22), the Sub-Committee agreed that the definition of "Polar Code" should include the text describing the mandatory or recommendatory nature of parts I-A, I-B, II-A and II-B of the Code in square brackets, and that the word "shall" contained in the text related to parts II-A and II-B should be replaced with the word "should".

3.27 In considering the definition of the term "all ships", the Sub-Committee decided that, for the purposes of regulation 1 of the Code, "all ships" should mean any ship to which SOLAS chapter I applies and ships constructed before, on or after the date of entry into force of the Code, but left the text in square brackets for further consideration by MSC 93, taking into account the two-step approach agreed by DE 55 (DE 55/22, paragraph 12.7).

Application

3.28 With regard to the proposals to include in draft regulation XIV/2.1, the words "engaged on international voyages", the Sub-Committee agreed to retain this text in square brackets for further consideration by MSC 93 (see also paragraph 3.25).

3.29 In considering whether to apply the Code to ships owned and/or operated by a State, the Sub-Committee, having considered the following two options:

- .1 not to apply the Code to warships, naval auxiliary or other ships owned or operated by a State and used only on government non-commercial service; or
- .2 not to apply the Code to warships, naval auxiliary or other ships owned or operated by a State and used only on government non-commercial service, but to encourage such ships to act in a manner consistent with the Code, so far as reasonable and practicable,

decided not to include relevant text within the Code since there was no clear majority for either of the above two options.

3.30 The Sub-Committee also considered the following two options regarding the rights or obligations of States under international law:

- .1 nothing in this chapter 1 of the Code shall prejudice the rights or obligations of States under international law, as reflected in the 1982 United Nations Convention on the Law of the Sea; or
- .2 nothing in this chapter 1 of the Code is intended to imply a change in the rights and obligations under other applicable international agreements or under customary international law as reflected in the 1982 United Nations Convention on the Law of the Sea,

and decided to include the text in option one above in square brackets, bearing in mind that the aforementioned text needs further refinement (e.g. replace States with Contracting Governments). Notwithstanding the above decision, the Sub-Committee recognized that a large number of those who spoke on the matter preferred to not include either option since a relevant provision on this subject has already been included in the draft Code.

Exemptions for novel features

3.31 In considering a proposal to have a specific provision in the draft new SOLAS chapter XIV to permit exemptions for novel features, the Sub-Committee agreed that the existing provision under SOLAS regulation I/4(b) was sufficient for dealing with such novel features, even though the new SOLAS chapter XIV is not listed in the aforementioned regulation. Some delegations were concerned that including a specific provision for exemptions in chapter XIV would only create confusion since the term "novel features" is not well defined and, as such, a ship could be exempted from any provision in the Code, including certification and carriage of a Polar Water Operational Manual (PWOM).

3.32 Having considered the above issues, the Sub-Committee agreed, in principle, to the draft new chapter XIV to SOLAS to make the Polar Code mandatory, as set out in annex 2, for submission to MSC 93, with a view to subsequent adoption at MSC 94 in conjunction with the adoption of the associated draft Polar Code (see paragraph 3.67), subject to the

Committee deciding on the text remaining in square brackets (see also paragraph 3.17), bearing in mind that the final texts of the SOLAS amendments should be aligned, as appropriate, with the associated amendments expected to be adopted to MARPOL (see paragraph 3.22).

SCOPE OF APPLICATION OF THE POLAR CODE

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

- .1 SDC 1/3/4 (New Zealand), discussing the application of the draft Polar Code to non-SOLAS ships, including fishing vessels, pleasure craft, MODUs, SPS and ships wintering over in ports, and how the application may be achieved;
- .2 SDC 1/3/15 (FOEI, WWF, IFAW, Pacific Environment), providing views on the application of the draft Polar Code of relevance to the proposed amendments to SOLAS and MARPOL, as contained in the report of the correspondence group (SDC 1/3/3), and to the proposed provisions of the draft Code contained in document SDC 1/INF.10;
- .3 SDC 1/3/17 (Russian Federation), discussing implications of the draft amendments to SOLAS and the corresponding draft text of the Polar Code (application) for "existing" ships in terms of the future Code; and
- .4 SDC.1/INF.2 (New Zealand), outlining key lessons learned by New Zealand when conducting Search and Rescue (SAR) operations in the Ross Sea with regard to the types of incidents that occur in the Ross Sea, the key features of SAR operations in the Ross Sea, and communication between Rescue Coordination Centres (RCCs) and operators.

3.34 After an in-depth discussion on matters related to the scope of application with regard to the types of ships to be covered by the Code, as well as its application to new and existing ships, the Chairman recalled that the MSC had tasked the DE Sub-Committee to cover all types of ships when developing the Polar Code and that DE 55, in considering how best to proceed, had decided to undertake the work based on a two-step approach, i.e. the Code would initially apply to SOLAS passenger and cargo ships, taking into account the urgent need for relevant mandatory requirements, and later requirements would be introduced for non-SOLAS ships, such as fishing vessels, which would be developed after the first step has been concluded. Therefore, it was decided that documents addressing non-SOLAS ships would be held in abeyance until such matters are considered by the Sub-Committee. With regard to the application of the Code to new and existing ships, the Sub-Committee, having noted that there was a clear majority for the Code to be applied to both new and existing ships, agreed that both new and existing ships should be certificated under the Code. With regard to structural requirements, the Sub-Committee instructed the Polar Code Working Group to further consider this issue with a view to developing concrete exemptions for the structural requirements that should not be applied to existing ships. In this connection, the Sub-Committee noted the statement by the delegation of the United States that, although the MSC had considered the application of the Polar Code and agreed to the two-step approach, MEPC had not had the same opportunity to discuss the applicability, specifically of part II-A, which includes proposed MARPOL amendments. As noted in the report of the Polar Code Working Group, the issue of part II-A applicability is to be sent to MEPC for full consideration. Some delegations noted that the chapters included in part II-A should retain the current applicability of the MARPOL parent Annexes. Subsequently, MEPC 66 was invited to note the above views regarding the application of the Polar Code and the two-step approach agreed by the MSC.

3.35 With regard to document SDC 1/3/17, the Sub-Committee instructed the Polar Code Working Group to further consider the proposal for a phasing-in period for existing ships and advise the Sub-Committee accordingly.

DEFINITION AND USE OF TEMPERATURE ON THE POLAR CODE

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

- .1 SDC 1/3/2 (Argentina), presenting a study of the aspects to be considered in selecting various temperature parameters appropriate to the matters that the Polar Code is intended to regulate, and proposing a set of definitions of "temperature" for inclusion in the Code to facilitate implementation;
- .2 SDC 1/3/9 (Canada), discussing how low air temperature requirements can be interpreted and applied to the design and operation of polar ships, and providing information and guidance on how temperature can be defined, selected and applied for polar class ships;
- .3 SDC 1/3/14 (Argentina), presenting the results of a statistical analysis of temperature variations with a view to determining design temperatures, in particular the determination of minimum anticipated temperature representing an estimate of absolute minimum recorded temperatures; and
- .4 SDC 1/INF.12 (Canada), providing information on statistical temperature data for polar and sub-polar regions.

3.37 Following a brief discussion, the Sub-Committee referred the above documents to the Polar Code Working Group for further consideration.

ENVIRONMENTAL PROTECTION ASPECTS OF THE POLAR CODE

General

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

- .1 SDC 1/3/1 (Kiribati, et al), proposing new text for insertion in paragraph 1.7.1 of chapter 1 of part II-A of the draft Code, as set out in the annex, regarding reception facilities for oil and oily mixtures, to ensure that adequate facilities are in place in Arctic waters;
- .2 SDC 1/3/18 (Russian Federation), proposing a change to paragraph 1.5.1.2 of chapter 1 of part II-A of the draft Code related to the prohibition of any discharges of oil or oily mixtures from any ship in the Arctic, and stating that a complete ban of such discharges, as currently provided for in paragraph 1.5.1.2, would be extremely difficult to adhere to, given the significant length of ships' voyages;
- .3 SDC 1/3/19 (United States), making explicit recommendations as to the applicability of the provisions contained in part II-A of the draft Code for new or existing ships and suggesting that all operational requirements should be applicable to existing ships; proposing the inclusion of text for adequate reception facilities for MARPOL Annexes I and II wastes in the corresponding chapters of part II-A of the draft Code; and recommending the deletion of the goals and functional requirements throughout part II-A and the incorporation of the substance of the functional requirements related to records, manuals and plans as prescriptive requirements in the corresponding chapters of part II-A; and

- .4 SDC 1/3/23 (FOEI, Pacific Environment and WWF), opposing the proposal in document SDC 1/3/1 regarding new text on port reception facilities for chapter 1 of part II-A of the draft Polar Code.

Ban of discharges into the sea of oil or oily mixtures

3.39 The Sub-Committee, having recalled that MEPC 65 had agreed to prohibit any discharges into the sea of oil or oily mixtures from any ships, did not agree to the changes to paragraph 1.5.1.2 of chapter 1 of part II-A of the draft Code as proposed by the Russian Federation (SDC 1/3/18), and noted the intention of this delegation to submit a document on the matter to MEPC 66.

Applicability of provisions contained in part II-A of the draft Code

3.40 The Sub-Committee, having agreed that the proposal by the United States concerning the applicability of provisions contained in part II-A of the draft Code (SDC 1/3/19, paragraphs 3 to 5) merited further discussion, referred the relevant part of the document to the Polar Code Working Group for further consideration.

Goal-based approach

3.41 Having considered the proposal by the United States (SDC 1/3/19, paragraphs 7 to 10) to delete the goals and functional requirements throughout part II-A of the draft Code, the Sub-Committee noted that it did not receive sufficient support.

Port reception facilities

3.42 During the discussion of the proposals concerning port reception facilities (SDC 1/3/1, SDC 1/3/19 and SDC 1/3/23), the following views, inter alia, were expressed:

- .1 "zero tolerance of illegal discharges from ships" can only be effectively enforced when there are adequate reception facilities in ports and the intention of the proposed regulatory text on port reception facilities is to provide support to the international shipping industry and to ensure that the Code can fully stand the test of time;
- .2 the proposed requirements on port reception facilities for ports within the Arctic area would be excessively burdensome, logistically and economically, on Arctic States and affected communities;
- .3 other arrangements can be made regarding the disposal of oil or oily mixture wastes, and adequate port reception facilities are already in place just outside the Arctic region; and
- .4 the relevant text in regulation 38 (Reception facilities) of MARPOL Annex I should be used rather than developing alternative text for inclusion in part II-A of the draft Code.

3.43 Following an extensive discussion and having noted the differing views on the matter, the Sub-Committee agreed not to instruct the Polar Code Working Group to further consider the issue and invited MEPC 66, bearing in mind that the matter in question is of a policy nature and that the Committee is the appropriate body to consider it, to note the debate (see paragraph 3.42), together with documents SDC 1/3/1, SDC 1/3/19 (paragraph 6) and SDC 1/3/23, and take action as appropriate.

HULL, MACHINERY AND EQUIPMENT

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

- .1 SDC 1/3/7 (France), presenting a proposal for encouraging ice-strengthening of category C ships intended for operation in polar waters where ice may be present;
- .2 SDC 1/3/8 (Canada, Norway), discussing how existing and new ships can be assigned a category and equivalent ice class based on structural analysis and risk assessment, intended to supplement the generic approximate equivalency tables in part I-B of the draft Polar Code, by providing a method for developing a ship specific assessment;
- .3 SDC 1/3/12 (France), commenting on tables 2.1 and 2.2 in part I-B of the draft Polar Code, which show correspondence between polar classes for existing ships and the requirements of classification societies; and
- .4 SDC 1/3/16 (Finland and Sweden), describing how the equivalence of ice class rules of international classification societies with the Finnish-Swedish Ice Class Rules has been determined.

3.45 Following a brief discussion, the Sub-Committee referred the above documents to the Polar Code Working Group for further consideration.

NAVIGATIONAL AND OPERATIONAL MATTERS AND POLAR WATER OPERATIONAL MANUAL (PWOM)

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

- .1 SDC 1/3/10 (Canada), providing proposals for a standardized table of contents for the PWOM and for additional guidance on detailed contents, in order to assist Administrations in reviewing the scope, reduce the complexity of training and lessen the possibility of misunderstanding;
- .2 SDC 1/3/11 (Argentina), containing proposals for consideration by the Polar Code Working Group in connection with the training of seafarers, in order to provide additional guidance for HTW 1;
- .3 SDC 1/3/13 (IHO), proposing a revised input to the Preamble, the list of hazards and chapter 10 (Safety of navigation) of the draft Polar Code, which was in response to the request by the Chairman of the Intersessional Working Group on the Polar Code for IHO to slightly amend the proposal contained in document DE 57/11/24;
- .4 SDC 1/3/20 (CLIA), commenting on the survival craft communications capabilities described in chapter 11 (Communication) of the draft Code and expressing the view that, in the absence of further justification, the proposed functional requirements for GMDSS on lifeboats and rescue boats should be deleted as it was not recommended by COMSAR 17;
- .5 SDC 1/3/21 (CLIA), commenting on the proposed requirements for personal and group survival equipment within chapter 9 (Life-saving appliances and arrangements) of the draft Code; and

- .6 SDC 1/3/22 (CLIA), commenting on the proposed requirements for nautical information within chapter 10 (Safety of navigation) of the draft Code and expressing the view that forward looking echo-sounding devices have merit under certain circumstances, but are not useful for all voyage types.

3.47 Following discussion, the Sub-Committee referred the above documents to the Polar Code Working Group for further consideration.

ESTABLISHMENT OF THE POLAR CODE WORKING GROUP

3.48 Consequently, the Sub-Committee established the Polar Code Working Group and instructed it, taking into account comments and decisions made in plenary, to finalize the draft International Code of Safety for Ships Operating in Polar Waters (Polar Code) on the basis of the reports of the correspondence groups (SDC 1/3/3, SDC 1/3/5, SDC 1/3/6, SDC 1/5 and SDC 1/INF.10), taking into account the documents submitted to this session.

REPORT OF THE WORKING GROUP

3.49 Having considered the report of the working group (SDC 1/WP.4), the Sub-Committee approved it in general and took action as described hereunder.

Part I-A (safety measures) of the draft Polar Code

Navigation and communication

3.50 The Sub-Committee agreed to forward the relevant paragraphs of the draft Code to NCSR 1, as indicated in paragraph 5 of document SDC 1/WP.4, for further consideration and finalization, and for submission directly to MEPC 67 and MSC 94, for their consideration when adopting the Code. In addition, the Sub-Committee decided to forward the entire chapters 10 and 11 to NCSR 1, for further examination and finalization, as appropriate, and also requested NCSR 1 to forward any comments and proposals directly to MSC 94. The Committee was invited to note the above decision.

Polar Water Operational Manual (PWOM)

3.51 With regard to possible approval of the PWOM by the Administration, the Sub-Committee noted that the group had generally agreed that the aforementioned manual need not be approved by Administrations; however, any operational limitations will have to be approved by the Administration.

Voyage planning

3.52 In considering the specific requirements for voyage planning, the Sub-Committee noted that the group had agreed to a list of matters the Master should consider during voyage planning. However, there was no agreement on the terminology addressing "wildlife" and "cetaceans" and, consequently, both terms were kept in square brackets. In this regard, it was noted that some delegations expressed concerns about how to implement the requirements since, due to lack of definite sources of data on densities of wildlife, the Master may be put in a difficult position during port State control inspections, should such requirements be made mandatory. Subsequently, the Sub-Committee endorsed the group's decision on specific requirements for voyage planning in chapter 12 of the draft Code, subject to MSC 93 resolving the text left in square brackets, taking into account that NCSR 1 has been invited to consider provisions on reporting (see paragraph 3.50 above).

3.53 In this connection, the Sub-Committee also endorsed the group's decision to move the provisions related to navigation with icebreaker assistance to part I-B, chapter 2.

Definition and use of temperature in the Polar Code

3.54 The Sub-Committee noted that the group agreed to add, in the Introduction, definitions for the terms "Ship intended to operate in low air temperature", "Mean Lowest Daily Low (Minimum) Temperature" and "Polar Service Temperature (PST)", with some text remaining in square brackets. Subsequently, the Sub-Committee endorsed the group's decision to insert definitions regarding temperature in the Introduction of the Code, taking into account that a number of definitions are still contained in square brackets.

Hull, machinery and equipment

3.55 The Sub-Committee noted that the group had comprehensively reviewed chapter 6 (Machinery installations) based on its decision on temperature and, in particular, had listed elements relating to machinery installations, which should be considered for all ships and for ships intended to operate in low air temperatures. With regard to possible application of these requirements to existing ships, the Sub-Committee endorsed the group's view that this matter should be further considered by the Committee.

3.56 With regard to provisions related to ship structures, the Sub-Committee endorsed the group's modifications to chapter 3 of the draft Code. With regard to paragraphs 3.3.2.3 and 3.3.2.4 of the draft Code, the Sub-Committee noted the concerns of the delegation of Norway on the way category C ships are handled in the Code. Whilst agreeing that some category C ships may not need ice-strengthening, this delegation believes that the prime requirements should be that category C ships shall be ice-strengthened. In its view, provisions to allow for operation with non-ice-strengthened ships in Polar areas could be included based on clear restrictions on the environmental conditions under which they may operate. Consequently, the delegation of Norway reserved its position on 3.3.2.3 and 3.3.2.4 of the draft Code. The delegations of Iceland and the United Kingdom also reserved their positions on the aforementioned paragraphs.

3.57 With regard to fire safety and life-saving arrangements, the Sub-Committee agreed to forward chapter 8 (Fire safety/protection) and paragraphs 9.3.3.3.4.4, 9.3.3.3.4.5 and 9.3.3.4 of chapter 9 (Life-saving appliances and arrangements) of the Code to the first session of the Sub-Committee on Ship Systems and Equipment (SSE 1), for consideration of the need for the development of new performance or test standards. In this regard, SSE 1 was invited to forward its views directly to MSC 93.

Training and manning

3.58 The Sub-Committee noted that the group had considered draft chapter 13, together with three alternative proposals included in document SDC 1/INF.10, and could not reach an agreement on a range of issues, including the introduction of "another person" (ice navigator or ice pilot). Consequently, the Sub-Committee agreed to forward all three options, as set out in the annex to document SDC 1/WP.4, together with document SDC 1/3/11, to HTW 1 for consideration and advice, as appropriate, to MSC 93.

3.59 In this connection, the Sub-Committee noted also that the group had discussed the level of additional qualifications, if any, that would be required on different ships for different operations and, as no agreement could be reached, agreed to also forward this issue to HTW 1 for consideration and advice, as appropriate, to MSC 93.

Application of the Code to existing ships

3.60 With regard to the application of the Code to existing ships, the Sub-Committee noted that the group had agreed to insert the following text in the Application section of chapter 1 in square brackets:

"[Ships built prior to [*date of entry into force*] shall meet the requirements of the Code with the exceptions of part I-A, paragraphs 4.2.1, 4.5.1 and 10.3.1.2.3.]",

taking into account the group's view that the application of the various requirements within the Code needed further consideration.

Part II-A (pollution prevention measures [environmental protection measures])***Application and goal of the Code***

3.61 The Sub-Committee noted that the group had agreed to insert the same principle on application used in the SOLAS amendments (see paragraph 3.60) in each chapter of part II-A. Notwithstanding this, the Sub-Committee noted that some delegations had pointed out that the proposed amendments in part II-A were negotiated with the understanding that MARPOL applicability for each of the parent annexes would be extended to the corresponding chapters of part II-A, with exceptions provided on a regulation-by-regulation basis.

3.62 The Sub-Committee also noted that the group, having noted concerns that the goal of MARPOL is wider than that of the Polar Code, had agreed to refer the matter to MEPC for further consideration.

Prevention of oil pollution

3.63 The Sub-Committee noted that the group had agreed to delete the text "[However, the Administration may approve alternative measures in fishing vessels [constructed before [date]]]" in paragraph 1.5.1.2 of part II-A of the draft Code, taking into account the two-step approach (see paragraph 3.25.1) agreed for part I-A (i.e. first step SOLAS ships, next step non-SOLAS ships). The Sub-Committee agreed to refer this matter for further consideration to the MEPC.

Prevention of pollution from noxious liquid substances

3.64 In considering matters related to the prevention of pollution from noxious liquid substances, the Sub-Committee noted that the group had considered paragraph 2.4.2.2 of part II-A of the Code, which states that, for new category A and B ships, all tanks used for carriage of noxious liquid substances shall be separated from the outer shell by a distance not less than 760 mm, and further noted concerns that this structural requirement, which is not included in the current IBC Code, would have an impact for Type III chemical tankers. The Sub-Committee agreed to refer this matter for further consideration to the MEPC.

Prevention of pollution by sewage from ships

3.65 When considering paragraph 4.4.1 of part II-A of the Code, the group had noted concerns regarding inconsistencies, since the paragraph contains cross-references with relevant regulations in MARPOL which are not included in other chapters of part II-A. In this connection, the Sub-Committee concurred with the view of the group regarding possible inconsistencies between chapters in part II-A of the Code and the associated MARPOL

Annexes, bearing in mind the impact of the Code's requirements on other certificates and documentation under the associated MARPOL Annexes, and agreed to refer the matter to the MEPC for review.

Certification and documentation

3.66 It was noted that the certification and verification regime, in terms of the status of the Polar Ship Certificate, the Polar Water Operational Manual and the implementation of the certification requirements with respect to existing statutory certification in SOLAS and MARPOL require further consideration. The possible administrative burden associated with a general update as opposed to a standalone set of polar documentation should be taken into account in any decisions by the MSC and the MEPC. It was further noted that the content and application of the Polar Ship Certificate had not been discussed and further work was needed. In particular, the documentation of the operational capabilities and limitations expected to be included in the Certificate remain to be defined. As such, it was noted that the implications in terms of verification of such documentation could only be considered after the content of the Certificate is established.

DRAFT INTERNATIONAL CODE FOR SHIPS OPERATING IN POLAR WATERS

3.67 Having considered the above matters, the Sub-Committee agreed, in principle, to the draft International Code for ships operating in polar waters (Polar Code), as set out in annex 3, for submission to MEPC 66 and MSC 93 for further consideration with a view to their adoption in conjunction with the adoption of the associated draft SOLAS and MARPOL amendments (see paragraphs 3.22 and 3.32), taking into account that a number of provisions still remain in square brackets throughout the draft Code (see also paragraph 3.69).

3.68 Taking into account the decision to relax the deadline (i.e. 21 February 2014) for the submission to MEPC 66 of documents commenting on the outcome of SDC 1 with regard to Polar Code matters (see paragraph 3.23), the Sub-Committee invited Member Governments and international organizations to submit comments and proposals to MEPC 66 and MSC 93 so that their views could be taken into account when the Committees consider the draft Code.

3.69 Noting the number of outstanding items remaining in the draft text of the Polar Code and the apparent limited availability of working arrangements at the upcoming sessions of the Committees, the Sub-Committee concurred with the view of the group that maximum resources should be made available and allocated by the Committees to reconciling these remaining items in a full and complete manner, with a view to ensuring the Code is fully developed prior to adoption. The Committees are invited to consider this view and take action as appropriate.

4 DEVELOPMENT OF PROVISIONS TO ENSURE THE INTEGRITY AND UNIFORM IMPLEMENTATION OF THE 1969 TM CONVENTION

4.1 The Sub-Committee recalled that SLF 55 established the Correspondence Group on the Development of Provisions to Ensure the Integrity and Uniform Implementation of the 1969 TM Convention, with terms of reference as set out in paragraph 9.16 of document SLF 55/17, and had instructed it to submit a report to this session.

Report of the working group (part 2) established at SLF 55

4.2 The Sub-Committee considered part 2 of the report of the Working Group on the Development of Provisions to Ensure the Integrity and Uniform Implementation of the 1969 TM Convention established at SLF 55 (SLF 55/WP.5/Add.1) and, having approved it in general, noted that the group's report had been considered in detail by the correspondence group established at SLF 55.

Report of the correspondence group and related submissions

4.3 The Sub-Committee considered the report of the correspondence group (SDC 1/4 and SDC 1/INF.4) and noted that the group prepared a draft TM.5 circular on Unified interpretations of the International Convention on Tonnage Measurement of Ships, 1969 (SDC 1/4, annex 1), to supersede TM.5/Circ.5. In this connection, the Sub-Committee also noted that the group developed, but could not reach agreement on, a number of different approaches to address the many complex issues related to tonnage implications of alterations and modifications, including provisions to accept national tonnages for certain older qualifying ships under article 3(2)(d) of the 1969 TM Convention (the so-called "GRT tonnage grandfathering provisions"). The Sub-Committee further noted that the group considered approaches and alternatives to implementing a reduced gross tonnage (GTr) parameter for accommodation spaces but could not reach agreement on this matter.

4.4 In addition, the Sub-Committee had the following documents for consideration:

- .1 SDC 1/4/1 (IACS), requesting clarification on how to measure the tonnage of ships constructed with material other than metal, so that this issue can be clarified in the ongoing work on the development of appropriate interpretations of the 1969 TM Convention;
- .2 SDC 1/4/2 (Germany), commenting on living conditions on board ships by means of a reduced gross tonnage (GTr) parameter for assessing fees;
- .3 SDC 1/4/3 (United States), commenting on the 1% criterion for alterations and modifications deemed to be a substantial variation in a ship's gross tonnage and proposing the deletion of the entire square-bracketed interpretation of A.3(2)(d) in annex 1 to document SDC 1/4; and
- .4 SDC 1/4/4 (IACS), proposing that an additional tolerance should be agreed addressing an acceptable per cent difference (2%) when remeasurement takes place on a ship where there has not been an alteration or modification.

4.5 Having considered the report of the correspondence group and the documents above, the Sub-Committee agreed that the proposal contained in document SDC 1/4/3, i.e. to delete the square-bracketed draft Unified interpretation A.3(2)d in annex 1 to document SDC 1/4, had not received sufficient support. Thus, the square brackets could be removed and the paragraph would remain intact.

4.6 With regard to the proposal for an acceptable per cent difference (2%) when remeasurement takes place on a ship where there has not been an alteration or modification, as contained in document SDC 1/4/4, the Sub-Committee noted that the proposal had received support and should be taken forward.

4.7 In considering the request for clarification on how to measure the tonnage of ships constructed with material other than metal, as contained in document SDC 1/4/1, the Sub-Committee agreed that this issue could be addressed by developing a draft unified interpretation but that further in-depth discussion was still required.

4.8 In considering the proposal contained in document SDC 1/4/2, the Sub-Committee noted the support to further develop a reduced gross tonnage parameter for accommodation spaces. In this regard, the observer from IFSMA stated that the issue of crew accommodation should be addressed without delay, either with a novel solution as suggested by Germany or with a simple solution such as the use of Net Tonnage. The full text of the statement by IFSMA is set out in annex 10.

4.9 With regard to the draft Unified interpretations of the 1969 TM Convention and the associated draft TM.5 circular set out in annex 1 to document SDC 1/4, the delegation of the Bahamas stated that they could not accept the proposed unified interpretation regarding regulation 1(3) in its current form as some of the language of the interpretation goes beyond the scope of an interpretation in its directions as to what "should not" or "cannot" be construed as "novel". These could be considered to be instructions and are contradictory to the provisions of the regulation, which sets out the absolute right of an Administration to apply the regulation as it deems appropriate. In addition, the delegation of the Bahamas expressed a further concern that the proposed unified interpretation could be used as grounds for one Administration to question the application of regulation 1(3) when neither article 11 on "Acceptance of Certificate" nor article 12 on "Inspection" provide any such right. Nevertheless, the unified interpretation would be acceptable to the delegation of the Bahamas if the text was limited to the final sentence. Consequently, the Sub-Committee agreed to place square brackets around the proposed unified interpretation for regulation 1(3) except for the last sentence, pending further consideration by the Committee.

4.10 The Sub-Committee also took note of the well-developed draft unified interpretations and figures (10 in total) identified in table 3-2 of annex 1 to document SDC 1/INF.4 which had received favourable support from the correspondence group but achieved only moderate consensus, and thus were not included in the draft TM.5 circular set out in annex 1 to document SDC 1/4. The Sub-Committee decided that these draft interpretations should be further considered by a drafting group for possible inclusion in the draft TM.5 circular being finalized at this session.

4.11 The delegation of India stated that, while many issues related to the 1969 TM Convention were resolved and suitable amendments to TM.5/Circ.5 had already been agreed at the time of SDC 1, there still remained 42 unresolved issues (out of the total 59 issues referred to in paragraph 9.5 of document SLF 54/17 and listed in annex 1 to document SLF 55/9 and annex 4 to document SDC 1/4), where a consensus had not yet been reached on the solutions to these issues. In this delegation's view, these 42 items, though unresolved at the time of SDC 1, were important for ensuring the integrity and uniform implementation of the 1969 TM Convention. It further stated that since this output was expected to be completed at SDC 1, the Sub-Committee should invite MSC 93 to extend the target completion date so as to cover all the unresolved items under paragraph 9.5 of document SLF 54/17, in order for the Committee to be in a position to fully appraise the status of work related to the 1969 TM Convention (see also paragraph 4.20). The statement by the delegation of India on the full list of 42 unresolved items is set out in annex 10.

Establishment of a drafting group

4.12 Having considered the above issues, the Sub-Committee established a Drafting Group on Development of Provisions to Ensure the Integrity and Uniform Implementation of the 1969 TM Convention and instructed it, taking into account the decisions taken in plenary, to:

- .1 finalize the draft unified interpretations to the 1969 TM Convention and the associated draft TM.5 circular, based on annex 1 to document SDC 1/4, taking into account documents SDC 1/4/1, SDC 1/4/4 and SDC 1/INF.4; and
- .2 taking into account document SDC 1/4/2, consider a reduced gross tonnage parameter for accommodation spaces with a view towards its further development, and if necessary, prepare draft terms of reference for a future group to progress the development of a reduced gross tonnage parameter for accommodation spaces and any work outstanding from documents SDC 1/4/1 and SDC 1/4/4.

Report of the drafting group

4.13 Having considered the report of the drafting group (SDC 1/WP.7), the Sub-Committee took action as outlined hereunder.

Draft Unified interpretations to the 1969 TM Convention

4.14 With regard to the proposals in documents SDC 1/4/1 and SDC 1/4/4, the Sub-Committee noted that the group had considered, but had not reached agreement on, the draft text for the proposed new interpretation regarding the measurement of ships constructed of materials other than metal and the proposed new interpretation establishing a 2% criterion for use in remeasurement when there has not been an alteration or modification to the ship. Consequently, both interpretations were not included by the group in the draft TM.5 circular.

4.15 The Sub-Committee also noted that the group evaluated the 10 interpretations and figures referred to in paragraph 4.10 above and that, out of the 10, the group agreed on changes to five figures, which were included in the draft TM.5 circular (SDC 1/WP.7, annex) under the appropriate interpretations (i.e. Length of Unusual Hull Configurations A.2(8)-2, Grates Over Deck Openings R.2(4)-9, Deck Breadth and End Openings R.2(5)-6, Cargo and Buoyant Spaces Open to the Sea R.6(3)-3 and Dockship N.2(1)).

4.16 Having considered the above issues, the Sub-Committee agreed to the draft Unified interpretations to the 1969 TM Convention and the associated draft TM.5 circular, as set out in annex 4, for submission to MSC 93 for approval, subject to the Committee's decision on the text in square brackets in the proposed unified interpretation for regulation 1(3) (see paragraph 4.9).

Reduced gross tonnage parameter for accommodation spaces

4.17 The Sub-Committee noted that the group had identified some matters from documents SDC 1/4/2, SLF 55/9/3, SDC 1/4 and SDC 1/INF.4 where consensus could be reached, such as the use of moulded dimensions for measurable volume boundaries, as described in table 2-5 of annex 3 to document SDC 1/INF.4, but also noted that the group had identified a number of issues where either clarification on the approach proposed by

document SDC 1/4/2 was needed or substantive further development would be required. These issues include:

- .1 linkage to minimum standards, i.e. whether accommodation spaces must meet some minimum standard in order to be eligible for exclusion;
- .2 difficulties in defining accommodation spaces, for example, whether the entire enclosed volume of a sailing training ship is eligible for exclusion; and
- .3 whether the approach of document SLF 55/9/3 for ships eligible for assignment of reduced gross tonnage calculated under multiple provisions is appropriate, for example, whether the formula for the open-top containership reduced gross tonnage "space equivalent volume" is valid.

4.18 The Sub-Committee noted that, due to time constraints, the group was unable to progress the work related to the further development of a reduced gross tonnage parameter and any other options to address accommodation spaces.

4.19 Consequently, the Sub-Committee invited Member Governments and international organizations to submit comments and proposals to SDC 2 with regard to:

- .1 further development of draft Unified interpretations to the 1969 TM Convention to address those items identified in documents SDC 1/4/1 and SDC 1/4/4, taking into account document SDC 1/WP.7, SDC 1/4, SDC 1/INF.4 and comments and decisions taken by SDC 1; and
- .2 further consideration of matters related to the development of a reduced gross tonnage parameter for accommodation spaces, taking into account document SDC 1/WP.7, the options in annex 3 to document SDC 1/4 and the proposal in document SDC 1/4/2.

Extension of the target completion year

4.20 Taking into account the further work needed on this output, the Sub-Committee invited the Committee to extend the target completion year for this output to 2015.

5 DEVELOPMENT OF SECOND-GENERATION INTACT STABILITY CRITERIA

General

5.1 The Sub-Committee recalled that SLF 55 re-established the Correspondence Group on Intact Stability, with the terms of reference as set out in paragraph 3.14 of document SLF 55/17, to continue the work on the development of second-generation intact stability criteria, taking into account the Updated plan of action agreed at that session (SLF 55/WP.3, annex 3).

Ice accretion in timber deck cargo

5.2 The Sub-Committee considered the relevant part of the report of the correspondence group (SDC 1/5) and, having approved it in general, noted that the group considered the development of draft guidance for ships carrying timber deck cargoes regarding the increased weight of ice, based on document SLF 55/3/8, and taking into account document SLF 55/3/10. In this connection, the amended draft text of chapter 6 of part B of the 2008 IS Code is set out in annex 2 of document SDC 1/5. The Sub-Committee also noted that there was a general agreement that the 2008 IS Code should have a minimum standard of ice accretion applicable to all ships operating in areas where icing may

occur. The formulation to account for the weight of ice accretion proposed for timber deck carriers could also be extended to other types of ships for which no specific guidance is contained in chapter 6 of the 2008 IS Code.

Second-generation intact stability criteria

5.3 In view of the above, Member Governments and international organizations are invited to submit comments and proposals on the amended draft text of chapter 6 of the 2008 IS Code, part B, to SDC 2.

5.4 The Sub-Committee considered the report of the correspondence group (SDC 1/5/3 and SDC 1/INF.8) and, having approved it in general, noted that the group had continued its work on the development of second-generation intact stability criteria.

5.5 In the context of the above, the Sub-Committee had the following documents for consideration:

- .1 SDC 1/5/1 (Germany), commenting on specific matters related to the development of the second-generation intact stability criteria, in particular, the level 3 criteria, and providing the opinion that level 3 criteria have to be released at the same time as levels 1 and 2 criteria;
- .2 SDC 1/5/2 (Germany), providing the recalculation of the sample vessels that have been used in document SLF 55/INF.5;
- .3 SDC 1/5/4 (Japan), providing a draft working version of explanatory notes on the vulnerability of ships to the broaching stability failure mode, in order to facilitate the discussion on the second-generation intact stability criteria at this session;
- .4 SDC 1/5/5 (Germany), proposing a way forward to finalize the work on the levels 1 and 2 excessive accelerations criteria, as follows:
 - .1 finalization of level 1: development of empirical formulae for effective wave slope, roll damping parameters and natural roll period. These formulae should be more accurate and also have significantly extended applicability range compared to the empirical formulae in the present weather criterion; and
 - .2 finalization of level 2: development of a simplified formulation for roll damping, which is more accurate than the formulation in level 1. This formulation should work for large breadth to draught ratios, including ratios characteristic for ballast conditions. Besides, an empirical formula for natural roll period is also required;
- .5 SDC 1/5/6 (Italy), with regard to the weighting factors of wave cases (SDC 1/INF.8, annex 3), pointing out that the weighting factors for the wave cases do not exactly sum up to 1.0, as the underlying procedure would require. The actual sum is, indeed, 1.000014. Although the difference from 1.0 is very small (1.4E-5), it is desirable to fix this discrepancy in the present early development stage. The reason for this difference is not associated with the theoretical background, but only concerns the truncation error associated with the significant digits which have been reported in the tables, both in the original submission by Italy

(SLF 55/INF.15, annex 1) and in subsequent texts developed by the correspondence group;

- .6 SDC 1/5/7 (China), commenting on the calculation method of roll damping utilized in the parametric rolling and excessive acceleration level 2 draft criteria of second-generation intact stability criteria, updated in the IS Correspondence Group report (SDC 1/5/3 and SDC 1/INF.8); and proposing to adopt a validated computational fluid dynamics (CFD) method as an added permissible method for the simulation of roll damping. Additionally, an option of calculation method for roll moment of inertia is proposed for consideration;
- .7 SDC 1/5/8 (SYBAss), containing sample calculation results of the proposed second-generation intact stability criteria regarding the levels 1 and 2 failure modes Parametric Roll and Pure Loss of Stability for super yachts. The results indicate that super yachts are more sensitive for Parametric Roll and Pure Loss of Stability in light conditions of loading;
- .8 SDC 1/5/9 (China), providing supplementary sample calculations for 52 loading conditions of 29 ships (oil tanker, bulk carrier, fishing vessel, LNG carrier and 25 containerships (seven of them installed with bilge keel)), using the draft criteria contained in document SLF 55/WP.3, and updated by the correspondence group. Based on the analysis of the results, further comments on the draft amendments of parametric rolling criteria (SDC 1/5/3 and SDC 1/INF.8, annex 1) are made;
- .9 SDC 1/5/10 (China), providing supplementary sample calculations for 42 loading conditions of 26 ships (containerships, oil tankers, bulk carriers, fishing vessels and one tumblehome ship) for a more comprehensive analysis of the effects of the draft criteria on the ships. Based on the analysis of the results, further comments on the draft amendments of pure loss of stability criteria (SDC 1/5/3 and SDC 1/INF.8, annex 2) are made; and
- .10 SDC 1/INF.6 (Italy and Japan), containing a working document regarding possible draft explanatory notes for vulnerability assessment methods for dead-ship stability failure mode. Although some aspects of the proposed calculation methodology are still open, the fundamental characteristics of the calculation method have been clarified and described.

5.6 Following consideration of the report of the IS Correspondence Group and the above related documents, the Sub-Committee agreed that the documents referred to in paragraph 5.5 should be further considered by a correspondence group. In this connection, the delegation of the United Kingdom, supported by Norway, made a statement, which is set out in annex 10.

Instructions to the Stability Working Group

5.7 Subsequently, the Sub-Committee instructed the Stability Working Group, established under agenda item 6 (Review of the damage stability regulations for ro-ro passenger ships), taking into account the comments and decisions made in plenary, to:

- .1 review the Updated plan of action for matters related to intact stability (SLF 55/WP.3, annex 3), taking into account the progress made intersessionally by the IS Correspondence Group (SDC 1/5, SDC 1/5/3 and SDC 1/INF.8), and prepare a revised plan, identifying the priorities, time frames and objectives for the work to be accomplished; and

- .2 prepare draft terms of reference for a correspondence group for consideration by the Sub-Committee.

Report of the Stability Working Group

5.8 Having considered the part of the report of the working group (SDC 1/WP.5) dealing with this agenda item, the Sub-Committee approved it in general and, in particular, agreed to the Updated plan of action for the second-generation intact stability criteria, as set out in the annex to document SDC 1/WP.5.

Establishment of a correspondence group

5.9 The Sub-Committee agreed to establish a Correspondence Group on Intact Stability, under the coordination of Japan,* and instructed it to continue to work on the items contained in the Updated plan of action for the second-generation intact stability criteria (SDC 1/WP.5, annex), taking into account relevant documents from previous sessions, and to:

- .1 finalize the draft amendments to the 2008 IS Code regarding vulnerability criteria and the standards (levels 1 and 2) related to parametric roll resonance, pure loss of stability and broaching-to (SDC 1/INF.8);
- .2 further develop the draft amendments to the 2008 IS Code regarding vulnerability criteria and standards (levels 1 and 2) related to dead ship condition and excessive accelerations (SDC 1/INF.8);
- .3 further enhance the working version of the Explanatory Notes for vulnerability criteria (SDC 1/INF.8);
- .4 further enhance the working version of the guidelines for "direct stability assessment" (SDC 1/INF.8); and
- .5 submit a report to SDC 2.

6 REVIEW OF DAMAGE STABILITY REGULATIONS FOR RO-RO PASSENGER SHIPS

General

6.1 The Sub-Committee recalled that SLF 55, having noted that views were divided on matters related to the residual freeboard option as part of the new requirements to account for water-on-deck effects, had decided that this issue should be further considered at this session.

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6.2 The Sub-Committee noted documents SDC 1/6 and SDC 1/INF.7 (Japan) and decided to consider them under agenda item 7 (Revision of SOLAS chapter II-1 subdivision and damage stability regulations) (see paragraphs 7.10.1).

Residual freeboard

6.3 The Sub-Committee recalled that SLF 55 had instructed the SDS Working Group to consider matters related to the residual freeboard option as new requirements to account for water-on-deck effects and that the outcome of the group's consideration is contained in paragraphs 10 to 30 of the group's report (SLF 55/WP.4).

6.4 In considering how best to proceed, and recalling that SLF 55 had noted the group's decision on excluding the residual freeboard option as part of the new requirements to account for water-on-deck effects, the Sub-Committee agreed that no further consideration of this matter was necessary.

6.5 In conclusion, the outcome of the working group established at SLF 55 (i.e. the Sub-Committee agreed, in principle, to the draft amendments to SOLAS regulation II-1/7-2.3 for submission to MSC for approval with a view to adoption, in conjunction with the adoption of the revised SOLAS chapter II-1 (paragraphs 21 to 23 and annex 3 of SLF 55/WP.4) was endorsed. These draft amendments will be submitted to MSC in conjunction with SOLAS amendments developed under agenda item 7 (refer also to paragraph 7.16).

6.6 Notwithstanding the above decision, the Sub-Committee noted the view of the delegation of the United Kingdom that there is ample evidence for the efficacy on the use of residual freeboard within damage stability assessments for ro-ro passenger ships from many research projects over a number of years, which included a large number of ships. The delegation stated that, in document SLF 55/INF.10, it presented details of a possible approach for the evaluation of ro-ro damage stability, which includes consideration of the accumulation of water on deck and does not impose an additional burden on ships that do not accumulate water on deck by virtue of having sufficient residual freeboard. The delegation was also of the view that this conclusion has been reached after full consideration of tried and tested data and as such is fully integrated and conforms with the probabilistic damage stability framework. It was in no doubt that the use of residual freeboard, as a proven method of compliance, offers a significant benefit with neither cost nor penalty implications for the industry, and strongly recommended that the Sub-Committee adopt the use of residual freeboard.

Completion of the work on the output

6.7 Subsequently, the Sub-Committee invited the Committee to note that the work on the output had been completed.

7 REVISION OF SOLAS CHAPTER II-1 SUBDIVISION AND DAMAGE STABILITY REGULATIONS

7.1 The Sub-Committee recalled that SLF 55 had re-established the SDS Correspondence Group, with terms of reference as set out in paragraph 8.20 of document SLF 55/17, and instructed the group to submit a report to this session.

7.2 The Sub-Committee noted that MSC 92, in considering the recommendations of the Working Group on Passenger Ship Safety (MSC 92/WP.8/Rev.1) related to the survivability of passenger ships, had agreed to forward documents MSC 92/6/6 and MSC 92/6/7, together with the EMSA and GOALDS studies (SLF 55/INF.6, SLF 55/INF.7, SLF 55/INF.8 and SLF 55/INF.9), to SDC 1 for consideration.

7.3 The Sub-Committee also noted that in light of the above, MSC 92 instructed SDC 1 to examine the phase 1 options that were technically justifiable for raising the Required Subdivision Index "R" and to review other aspects deemed relevant to the issue, such as the length of the ship, number of persons on board and practical and operational aspects, taking into account actual economic factors, and advise MSC 93 accordingly.

7.4 The Sub-Committee further noted that MSC 92 instructed the Experts Group on Formal Safety Assessment (FSA) to review the EMSA and GOALDS studies (SLF 55/INF.6, SLF 55/INF.7, SLF 55/INF.8 and SLF 55/INF.9), taking into account the risk models and calculated risk and the validity of the data and assumptions that were used, based on the revised FSA Guidelines (MSC-MEPC.2/Circ.12). The report of the FSA Experts Group is contained in document MSC 93/6/2.

7.5 The Sub-Committee further noted that MSC 92, in considering the recommendations of the Working Group on Passenger Ship Safety (MSC 92/WP.8/Rev.1), expanded this planned output to include consideration to limit the down-flooding points on the bulkhead deck for passenger ships.

Report (part 2) of the working group established at SLF 54

7.6 The Sub-Committee considered part 2 of the report of the SDS Working Group at SLF 55 (SLF 55/WP.4/Add.1) and, having approved it in general, noted that the group's report had been considered in detail by the SDS Correspondence Group (SDC 1/7 and Add.1) established at SLF 55.

Report of the correspondence group and related submissions

7.7 The Sub-Committee considered the report of the correspondence group (SDC 1/7 and Add.1) and, having approved it in general, noted that the group had progressed the work on the revision of SOLAS chapter II-1 subdivision and damage stability regulations and the associated explanatory notes considerably, as set out in the annexes to the report, but noted that a vast amount of work was still needed.

7.8 In this context, the Sub-Committee also considered the following documents:

- .1 SDC 1/7/1 (Germany), providing an alternative method to the use of GM limiting curves to comply with SOLAS chapter II-1, parts B-1 to B-4;
- .2 SDC 1/7/4 (United States), commenting on document SDC 1/7, proposing revised text for SOLAS regulations II-1/2.19 and II-1/7.3 and offering an editorial correction for regulation II-1/8.1. The proposals to amend the draft regulation's text are intended to improve clarity to support the completion of the draft amendments at this session; and
- .3 SDC 1/7/5 (Republic of Korea), commenting on document SDC 1/7 with regard to the new draft SOLAS regulation II-1/9.3.3 in order to improve the transparency in applying this regulation.

7.9 In considering the above documents, the Sub-Committee, having noted the concerns expressed regarding the alternative method proposed in document SDC 1/7/1, decided to forward all of the documents to the Stability Working Group (see paragraph 7.14) for further consideration when finalizing the draft amendments to SOLAS chapter II-1.

Survivability of passenger ships

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

- .1 SDC 1/6 and SDC 1/INF.7 (Japan), providing information on the technical consideration of the Required subdivision index "R" and other relevant aspects, such as escape, evacuation and operational aspects;
- .2 SDC 1/7/2 (United States), providing a proposal for a moderate phase 1 increase in the SOLAS regulation II-1/6 passenger ship Required subdivision index "R", to be included in the comprehensive package of revisions to SOLAS chapter II-1 subdivision and damage stability regulations, which should only apply to new passenger ships;
- .3 SDC 1/7/3 (CLIA), providing information on the work of the Cruise Ship Safety Forum (CSSF), a tripartite group of cruise ship operators, shipbuilders, and classification societies, on matters related to damage stability on cruise ships, including solutions for newbuilding and existing ships, and in particular probabilistic damage stability, watertight doors and damage response tools/procedures that represent a comprehensive approach from the design, operation and emergency situation management aspects of the ship; and
- .4 SDC 1/7/6 (CESA), commenting on the proposals (SDC 1/7/2) for a moderate phase 1 increase of the SOLAS requirements for the Required subdivision index "R" for passenger ships.

7.11 Following discussion, the Sub-Committee decided to forward documents SDC 1/6 and SDC 1/INF.7 to MSC 93 for consideration together with the report of the FSA Experts Group (MSC 93/6/2) and, having noted the support for the proposals in document SDC 1/7/2, decided to instruct the working group to use the aforementioned document as a starting point for discussion on this issue, taking into account documents SDC 1/7/3, SDC 1/7/6, MSC 92/6/6 and MSC 92/6/7, and also the relevant comments made in plenary.

7.12 Notwithstanding the above decision, the Sub-Committee noted statement by the observer from the European Commission regarding documents SDC 1/6 and SDC 1/INF.7, the full text of which is set out in annex 10.

Limit the down-flooding points on the bulkhead deck for passenger ships

7.13 Whilst noting that no documents were submitted on matters related to limiting the down-flooding points on the bulkhead deck for passenger ships, the Sub-Committee invited Member Governments and international organizations to submit comments to SDC 2.

Instructions to the Stability Working Group

7.14 In light of the above, the Sub-Committee instructed the Stability Working Group, established under agenda item 8 (see paragraph 8.5), taking into account the comments and decisions taken in plenary, to:

- .1 finalize the draft amendments to SOLAS chapter II-1, based on part 2 of the report of the working group at SLF 55 (SLF 55/WP.4/Add.1) and the report of the correspondence group (SDC 1/7 and Add.1), taking into account documents SDC 1/7/1, SDC 1/7/4 and SDC 1/7/5;
- .2 further consider matters related to the survivability of passenger ships, taking into account documents SDC 1/7/2, SDC 1/7/3, SDC 1/7/6, MSC 92/6/6 and MSC 92/6/7;
- .3 examine the phase 1 options in document MSC 92/6/6, taking into account documents SDC 1/7/2, SDC 1/7/3, SDC 1/7/6 and MSC 92/6/7, which are technically justified for raising the Required subdivision index "R" and review other aspects deemed relevant to the issue, such as the length of the ship, number of persons on board, and practical and operational aspects, taking into account actual economic factors, and advise the Sub-Committee accordingly;
- .4 consider whether it is necessary to establish a correspondence group and, if so, prepare terms of reference for consideration by the Sub-Committee; and
- .5 submit a written report (part 1) to this session and submit part 2 of the report to SDC 2, as soon as possible after this session, so that it can be taken into account by the correspondence group.

Report of the Stability Working Group

7.15 Having considered the part of the report of the Stability Working Group (SDC 1/WP.5/Add.1) dealing with this item, the Sub-Committee took action as outlined hereunder.

Proposed amendments to SOLAS chapter II-1

7.16 The Sub-Committee agreed, in principle, to the proposed amendments to SOLAS chapter II-1, as set out in annex 1 to document SDC 1/WP.5/Add.1, and endorsed the group's decision to continue working on them with a view to the results being included in part 2 of the report of the working group, to be issued as soon as possible after the session so that they may be taken into account by the correspondence group (see paragraph 7.18).

Increase in the required subdivision index "R"

7.17 The Sub-Committee endorsed the group's view on its agreement, in principle, to a moderate phase 1 increase in the Required subdivision index "R" using document SDC 1/7/2 as a basis for further development.

Establishment of a correspondence group

7.18 In order to make further progress on this output interessionally, the Sub-Committee agreed to establish a Correspondence Group on Subdivision and Damage Stability (SDS), under the coordination of the United Kingdom,^{*} and instructed it to:

- .1 finalize the draft amendments to SOLAS chapter II-1, part B-4 and regulation 35-1, based on annex 1 to document SDC 1/WP.5/Add.1;
- .2 finalize the draft amendments to the Explanatory Notes to the SOLAS chapter II-1 subdivision and damage stability regulations (SDC 1/7/Add.1, annex), taking into account part 2 of the report of the SDS Working Group established at SDC 1;
- .3 further develop, with a view to finalizing, a phase 1 option for a moderate increase in the Required subdivision index "R" for passenger ships, taking into account the relevant outcome of MSC 93; and
- .4 submit a report to SDC 2 (see also paragraph 8.7).

8 DEVELOPMENT OF GUIDELINES ON SAFE RETURN TO PORT FOR PASSENGER SHIPS

General

8.1 The Sub-Committee recalled that SLF 55 had re-established the SDS Correspondence Group with terms of reference, as set out in paragraph 4.13 of document SLF 55/17, and instructed the group to submit a report to this session.

Report of the correspondence group and related submissions

8.2 The Sub-Committee considered the report of the correspondence group (SDC 1/8) and noted that the report summarizes the work and recommendations of the group regarding the further development of guidelines on safe return to port for passenger ships with respect to the accuracy of damage stability calculation modules and their approval. The Sub-Committee also noted that the group agreed that guidelines for the approval of damage stability modules, as originally defined by Germany (MSC 89/9/4) and subsequently agreed by SLF 53 (SLF 53/19, paragraph 7.17), should be developed. In this context, the Sub-Committee further noted that the group recommended that some work is also needed on reconsidering the *Guidelines on operational information for masters of passenger ships for safe return to port by own power or under tow* (MSC.1/Circ.1400) in the light of the view first expressed by IACS, in document SLF 54/4/1 (SLF 54/17, paragraphs 4.6 and 4.7), that post-damage strength assessments should, in view of their complexity, only be undertaken by shore-based systems.

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8.3 In the context of the above, the Sub-Committee also considered document SDC 1/8/1 (Germany), drawing attention to potential weaknesses of the *Guidelines on operational information for masters of passenger ships for safe return to port by own power or under tow* (MSC.1/Circ.1400), which might lead to partly ineffective application of SOLAS regulation II-1/8-1, due to a lack of detailed technical information; and proposing to develop an improved guideline for the approval of stability software which clearly addresses also all the damage stability related matters that are still missing in the *Guidelines for the approval of stability instruments* (MSC.1/Circ.1229) and which is covers most ship types.

8.4 Following discussion, the Sub-Committee agreed that the working group should consider the comments made in plenary when addressing the matter, bearing in mind that this work is of high priority since it will directly support the implementation of SOLAS regulation II-1/8-1 (System capabilities after a flooding casualty on passenger ships), which entered into force on 1 January 2014.

Establishment of the Stability Working Group

8.5 Recalling the relevant decision at MSC 92, the Sub-Committee established the Stability Working Group and instructed it, as a high-priority matter, to further develop the draft Guidelines for the approval of damage stability modules for safe return to port, taking into account the report of the correspondence group (SDC 1/8) and document SDC 1/8/1.

Report of the Stability Working Group

8.6 Having considered the part of the report of the Stability Working Group (SDC 1/WP.5/Add.1) dealing with this item, the Sub-Committee endorsed the group's view on the stepped approach to be taken on developing guidance for the approval of damage stability modules for safe return to port whereby prioritized deliverables can be developed. In addition, the Sub-Committee agreed on the list of action items to be considered when further developing the above guidelines (SDC 1/WP.5/Add.1, annex 2).

Instructions to the SDS Correspondence Group

8.7 Consequently, the Sub-Committee instructed the SDS Correspondence Group, established under agenda item 7 (see paragraph 7.18), to further develop the draft Guidelines for the approval of damage stability modules for safe return to port, taking into account the suggested actions outlined in annex 2 of document SDC 1/WP.5/Add.1, and to prioritize these actions, as deemed appropriate.

9 AMENDMENTS TO SOLAS REGULATION II-1/11 AND DEVELOPMENT OF ASSOCIATED GUIDELINES TO ENSURE THE ADEQUACY OF TESTING ARRANGEMENTS FOR WATERTIGHT COMPARTMENTS

General

9.1 The Sub-Committee recalled that DE 57 had for its consideration documents DE 57/16 and DE 57/INF.6 (IACS), containing updated draft *Guidelines for procedures of testing tanks and tight boundaries*, and documents DE 57/16/1 and DE 57/INF.7 (China, Japan, Republic of Korea and IACS), reporting on the work of a joint industry working group (JWG) regarding quality control of shipyards when carrying out tests for tanks and tight boundaries according to the procedures set out in document DE 57/INF.6, and providing a draft *Guidance on survey of the quality management systems on testing tanks and tight boundaries for shipyards*, developed by the JWG, which is proposed to be an annex to the

draft *Guidelines for procedures of testing tanks and tight boundaries*, as set out in the annex to document DE 57/INF.6.

9.2 The Sub-Committee also recalled that DE 57 had noted that the Secretariat, in order to facilitate the discussions, had prepared a working paper (DE 57/WP.3), containing the complete text of the proposed draft guidelines (DE 57/INF.6 and DE 57/INF.7) in the three working languages.

9.3 The Sub-Committee noted that DE 57, due to time constraints, had decided to defer consideration of this agenda item to this session.

9.4 The Sub-Committee had the following documents for consideration:

- .1 SDC 1/9 and SDC 1/INF.13 (IACS), reiterating support of the proposed amendments to SOLAS regulation II-1/11, as presented in paragraph 12 of document MSC 89/23/12; containing information on informal discussions with interested stakeholders since DE 57; and providing updated draft guidelines for procedures of testing tanks and tight boundaries (SDC 1/INF.13, annex);
- .2 SDC 1/9/1 (Japan), providing a proposed revised draft *Guidance on verification of the quality management systems on testing tanks and tight boundaries for shipyards*, which took into account the outcome of the joint industry working group (JWG) and other information available; and
- .3 SDC 1/9/2 (China), providing comments on documents SDC 1/9 and SDC 1/INF.13 (IACS) and supporting the proposal by IACS that the latest version of the draft Guidelines (SDC 1/INF.13) should be referred to an appropriate working group for finalization, taking into account that the draft guidelines do not contain draft guidance on verification of the quality management systems on testing tanks and tight boundaries for shipyards.

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

- .1 the possibility of decreasing the level of safety by replacement of physical tests with modelling simulations;
- .2 the absence of an equivalence between the current SOLAS requirement and the proposed alternative;
- .3 the need to avoid automatically granted exemptions;
- .4 verification of a shipyard quality system by different Flag Administrations;
- .5 the non-mandatory status of the proposed draft guidelines for procedures of testing tanks and tight boundaries; and
- .6 the need to take into account dynamic aspects of operational conditions.

Instructions to the Working Group on Construction

9.6 Having considered the above views, the Sub-Committee instructed the Working Group on Construction, established under agenda item 19 (Carriage of more than 12 industrial personnel on board vessels engaged in international voyages), taking into account documents MSC 86/23/13, SDC 1/9, SDC 1/9/1, SDC 1/9/2 and SDC 1/INF.13 and the comments and decisions made in plenary, to:

- .1 prepare an action plan, identifying the priorities, time frames and objectives for the work to be accomplished under this output; and
- .2 prepare draft terms of reference for a correspondence group for consideration by the Sub-Committee.

Report of the Working Group on Construction

9.7 Having considered the part of the report of the working group (SDC 1/WP.6/Add.1) dealing with this agenda item, the Sub-Committee approved it in general and took action as outlined hereunder.

Draft Guidelines for procedures of testing tanks and tight boundaries

9.8 The Sub-Committee endorsed the deliberations and views of the group, as set out in paragraphs 4 to 8 of document SDC 1/WP.8/Add.1, regarding the preparation of draft guidelines on survey of the quality management systems on testing tanks and tight boundaries for shipyards, as set out in document SDC 1/INF.13, which the group had agreed provided a suitable basis for further consideration.

9.9 With regard to production quality standards provided in documents SDC 1/9/1 and SDC 1/9/2, the Sub-Committee noted that different options were discussed in order to integrate respective criteria into the guidelines, such as using existing standards or to further develop separate guidelines for those standards. In this regard, the Sub-Committee noted that the sole application of the ISO 9001 standard would not necessarily ensure the appropriate production quality.

9.10 The Sub-Committee noted the group's view that highly outfitted spaces not intended to hold liquids should not be subject to hydrostatic tests. Additionally, it was noted that the group concurred that the existing SOLAS regulation II-1/11 does not necessarily include hydrostatic testing of all watertight boundaries and, therefore, it should be discussed whether such watertight boundaries should be tested in future in accordance with the guidelines to be developed.

Plan of action

9.11 The Sub-Committee endorsed the group's views regarding the plan of action and the required time frames in order to accomplish the planned output on amendments to SOLAS regulation II-1/11 and development of associated guidelines to ensure the adequacy of testing arrangements for watertight compartments.

Establishment of a correspondence group

9.12 In order to make further progress on this output intersessionally, the Sub-Committee agreed to establish a Correspondence Group on Amendments to SOLAS regulation II-1/11 and Development of Associated Guidelines to Ensure the Adequacy of Testing

Arrangements for Watertight Compartments, under the coordination of Japan,* and instructed it, based on documents MSC 86/23/13, MSC 86/26, DE 57/25, SDC 1/WP.1, SDC 1/9, SDC 1/9/1, SDC 1/9/2 and SDC 1/INF.13, to:

- .1 identify conditions for granting a waiver with the use of alternative tests from hydrostatic testing of water tightness and structural integrity as provided in the existing SOLAS regulation II-1/11;
- .2 consider a possible amendment to SOLAS based on documents MSC 86/23/13, MSC 86/26 (paragraphs 23.36 and 23.37) and DE 56/25, taking into account the outcome of the above instruction;
- .3 evaluate the possible ways for application of the draft guidelines for procedures of testing tanks and tight boundaries, including their mandatory status;
- .4 consider details of the quality control standards and how their application should be assessed in order to assure the quality of structural fabrication to achieve the water tightness and structural integrity, taking into account documents SDC 1/9/1 and SDC 1/9/2;
- .5 continue developing the draft *Guidelines for procedures of testing tanks and tight boundaries*, as contained in document SDC 1/INF.13 and possibly in context of the quality control standard as contained in documents SDC 1/9/1 and SDC 1/9/2, with a view to providing an equivalent level of safety to the existing SOLAS regulation II-1/11;
- .6 develop a suitable common terminology (definitions), taking into account the draft Guidelines contained in document SDC 1/INF.13; and
- .7 submit a report to SDC 2.

Working arrangements during the session

9.13 The Sub-Committee noted the concerns expressed by the delegation of Greece and others on the procedural aspects of having two separate groups (e.g. different terms of reference, Chairmen and participants) being treated by the Sub-Committee as a single working group. As this was the first meeting of the new biennium, they expressed the view that this type of arrangement should not be repeated in other bodies.

10 DEVELOPMENT OF AMENDMENTS TO THE 2011 ESP CODE

10.1 The Sub-Committee recalled the new procedure for undertaking regular updates to the 2011 ESP Code agreed at DE 57 (DE 57/25, paragraph 24.5) and noted that MSC 92 had concurred with the aforementioned procedure.

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

- .1 SDC 1/10 (IACS), containing proposed amendments to the 2011 ESP Code, which take into account the procedure agreed at DE 57 and endorsed by MSC 92, in order to deal with updates to the IACS UR Z10 series, and noting that no proposals were made at this time to amend any of the annexes to annex A, parts A and B, or to annex B, parts A and B; and
- .2 SDC 1/INF.3 (IACS), providing, at annex, a "track changes" version of the 2011 ESP Code, as per the agreed procedure at DE 57, showing proposed updates to the Code to provide alignment with the IACS UR Z10 series.

10.3 In considering the list of the proposed amendments set out in paragraph 4 of document SDC 1/10, the Sub-Committee took the following actions:

- .1 it concurred with annexes A and B, parts A and B, paragraph 5.3.2.3 – i.e. hydraulic arm vehicles such as conventional cherry pickers are added as a means of access for close up surveys of the hull structure;
- .2 it concurred with annexes A and B, parts A and B, new paragraph 5.5 – this new paragraph states that rescue and emergency response equipment should be suitable for the configuration of the space being surveyed, as IACS members have noted a few cases where emergency response equipment could not be used due to the different configuration with the means of access equipment;
- .3 it did not concur with Annex B, parts A and B, paragraph 2.6.1 – guidelines and conditions are included to consider the master's statement regarding cargo tank testing;
- .4 it concurred with annex A, parts A and B, and annex B, part A, paragraphs 6.1.3 and 6.3.2 – new provisions relating to maintaining and updating the Ship Construction Files (SCF) on board are included for ships subject to the requirements of the IMO Goal-based Standards (GBS) regime; and
- .5 it concurred with annex A, parts A and B, and annex B, part A, paragraphs 6.4.2 and 6.4.3 – new provisions on verifying the updating of the Ship Construction Files (SCF) are included for ships subject to the requirements of the IMO Goal-based Standards (GBS) regime.

10.4 With regard to paragraph 10.3.3 above, the IACS observer commented upon the decision of the Sub-Committee that the testing of cargo oil tanks shall only be done in the presence of a surveyor. The IACS observer noted that the proposal to allow the vessel's crew to undertake this testing under the direction of the master would be subject to a number of specific conditions. The following implications of the Sub-Committee's decision were also brought to the attention of the Sub-Committee. The cargo of an oil tanker has a density less than water, therefore in order to avoid any undue stress on the ship's structure, it is preferable to test the tank as loaded with the cargo. Tank testing when the ship is under survey, which almost certainly will be with water (fresh or sea), needs to be carefully planned and undertaken in order to avoid unintentional overloading of the structure. Further challenges present themselves with respect to any draft restrictions at the survey location; lack of availability of appropriate water quality due to limited water depth (mud suck into tanks); cleaning of piping, pumps and tanks; and difficulties in disposing of very large

quantities of "contaminated" water upon completion of testing (availability of suitable and adequate reception facilities).

10.5 Following consideration, the Sub-Committee agreed to the draft amendments to the 2011 ESP Code, as set out in annex 5, for submission to MSC 93 for approval, with a view to subsequent adoption.

11 DEVELOPMENT OF GUIDELINES FOR USE OF FIBRE-REINFORCED PLASTIC (FRP) WITHIN SHIP STRUCTURES

11.1 The Sub-Committee recalled that FP 56 established the Correspondence Group on Development of Guidelines for Use of Fibre-reinforced Plastic (FRP) within Ship Structures, with the terms of reference as set out in paragraph 12.5 of document FP 56/23, and instructed it to submit a report to this session.

Report of the correspondence group

11.2 The Sub-Committee considered the report of the correspondence group (SDC 1/11 and SDC 1/INF.5) and noted that the group could not reach consensus regarding the possible use of FRP composite structures in the light of SOLAS regulation II-2/17, having regard to regulation II-2/2 (Fire safety objectives and functional requirements):

- .1 the first view, agreed by the majority of the group, supported the position that all of the prescriptive requirements in parts B, C, D, E and G in SOLAS chapter II-2 can be deviated from provided that the alternative design and arrangement can meet the fire safety objectives and functional requirements of SOLAS chapter II-2; and
- .2 the second view, supported by some of the group, was that the objectives in part A of SOLAS chapter II-2 may not be altered by the regulations in the other parts, since these are fundamental requirements of chapter II-2, and regulation II-2/17 should not be used to alter those provisions.

11.3 The Sub-Committee also noted the group's conclusion that the current prescriptive regulations assume non-combustible construction. Therefore, if SOLAS regulation II-2/17 is used to justify the use of combustible structures, a thorough review of SOLAS chapter II-2 is required to find any prescriptive requirements affected by an alternative design that assumes non-combustible construction. It was pointed out that the aforementioned matter needs to be resolved first in order to further progress the work on the draft guidelines (SDC 1/INF.5).

11.4 In this context, the Sub-Committee further noted the proposal by the group that the scope of the draft guidelines should be broadened to cover not only the use of FRP in structures, but also other uses of FRP on board ships, which would facilitate the approval process of FRP used in restricted applications on ships.

11.5 Following discussion, the Sub-Committee, having noted the views expressed regarding structural integrity during a fire (e.g. as a result of loss of local bonding), practical experience on use of FRP on board ships, the need for reviewing many of the requirements of SOLAS chapter II-2 and compliance with all the relevant functional requirements of SOLAS regulation II-2/2.2, agreed that the matter is complex and that a cautious approach is necessary.

11.6 In considering a possible way forward, the Sub-Committee, taking into account the differing views expressed during the discussion, agreed to the following way forward:

- .1 to reinstate the correspondence group to continue its work based on the first view (see paragraph 11.2.1), as well as on the terms of reference approved by FP 56, and define the consequences that this view would have on the other issues than fire protection for consideration at SDC 2;
- .2 to instruct the correspondence group to review the matter raised by IACS at FP 56 regarding the use of FRP grating on tankers; and
- .3 to invite the Committee to endorse the view that the background of the objectives in part A of SOLAS chapter II-2 needs to be reconsidered before deciding on the restricted use of FRP materials.

ISO Standards related to FRP construction

11.7 The Sub-Committee also noted the information provided by the observer from ISO on the development of two new standards (ISO 300021 and ISO 834-12) that may be used in conjunction with the FTP Code, part 3, for fibre-reinforced plastics.

Establishment of a correspondence group

11.8 To progress the work on the matter intersessionally, the Sub-Committee established a Correspondence Group on Development of Guidelines for Use of Fibre-reinforced Plastic (FRP) within Ship Structures, under the coordination of Sweden*, and instructed it, taking into account documents SDC 1/11, SDC 1/INF.5, FP 56/12, FP 56/12/1, FP 56/12/2 and FP 56/INF.9 and the discussion at SDC 1, to:

- .1 determine the possible use of FRP composite structures in the light of SOLAS regulation II-2/17, having regard to regulations II-2/2.1 (Fire safety objectives), II-2/2.2 (Functional requirements) and II-2/2.3 (Achievement of the fire safety objectives) and, taking into account the view expressed in paragraph 8 of document SDC 1/11, define the consequences that the aforementioned view would have on the other issues than fire protection;
- .2 review available fire testing results and research and methodologies with regard to FRP composite structures in ships, as well as current regulations and relevant applications of FRP composite structures;
- .3 develop draft guidelines to be used for assessment and testing of FRP structures;
- .4 discuss if any relevant new procedures and qualification criteria for fire testing and classification of FRP composite structures are required for use on SOLAS ships;

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- .5 further consider document FP 56/9/7 (IACS) regarding the use of FRP grating on tankers and advise the Sub-Committee accordingly; and
- .6 submit a report to SDC 2.

Extension of target completion year

11.9 In light of the above decision, the Committee was invited to extend the target completion year for this output to 2015.

12 DEVELOPMENT OF AMENDMENTS TO SOLAS CHAPTER II-2, THE FTP CODE AND MSC/CIRC.1120 TO CLARIFY THE REQUIREMENTS FOR PLASTIC PIPES ON SHIPS

General

12.1 The Sub-Committee recalled that FP 56, having considered document FP 56/14 (Denmark), proposing to introduce a requirement for a fire endurance test for plastic pipes penetrating bulkheads and decks and questioning whether the test requirements for pipe penetrations in the FTP Code are adequate to prevent the spread of fire downwards, noted that the aforementioned proposal was supported in general.

12.2 The Sub-Committee also recalled that FP 56 had agreed that the matter needed further detailed consideration and had invited Member States and international organizations to submit comments and proposals on documents FP 56/14 and MSC 88/23/8 to this session.

12.3 In the context of the above, the Sub-Committee further noted that FP 56 had agreed that the scope of the item should also include a possible review of the *Guidelines for the application of plastic pipes on ships* (resolution A.753(18), as amended by resolution MSC.313(88)).

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

- .1 SDC 1/12 (Denmark), proposing to revise the requirement in the *Guidelines for the application of plastic pipes on ships* (resolution A.753(18), as amended by resolution MSC.313(88)), in order to include specific provisions on the smoke and toxicity requirements; and to divide the use of plastic pipes into three groups and to revise the test requirement and the fire endurance matrix accordingly; and
- .2 SDC 1/INF.9 (Denmark), providing detailed information on the proposed modifications contained in document SDC 1/12.

12.5 Following discussion, the Sub-Committee, having noted several general views expressed on technical matters and application issues, agreed that further detailed consideration was necessary and invited Member Governments and international organizations to submit comments and proposals to SDC 2.

Extension of the target completion year

12.6 Consequently, the Sub-Committee invited the Committee to extend the target completion year for this output to 2015.

13 REVIEW OF THE RECOMMENDATION ON EVACUATION ANALYSIS FOR NEW AND EXISTING PASSENGER SHIPS

General

13.1 The Sub-Committee recalled that FP 56 had noted that the issue of evacuation in an emergency was included in the long-term work plan of the Organization on the enhancement of safety of passenger ships (MSC 91/WP.8, annex 3), as agreed by MSC 91 in response to the **Costa Concordia** casualty.

13.2 The Sub-Committee also recalled that FP 56, having recognized that the review of recommendations on evacuation analysis was a high-priority item and that the issue of modelling the human behaviour in an emergency represented a complex problem, decided to request an extension of the target completion year for this output, and invited Member States and international organizations to submit detailed proposals to this session.

13.3 The Sub-Committee noted that MSC 92, having noted the consideration by the Working Group on Passenger Ship Safety of documents MSC 92/6/2, MSC 92/6/4, MSC 92/6/10 and MSC.1/Circ.1238 related to evacuation analysis, agreed to instruct SDC 1 to consider the mandatory application of evacuation analysis to non-ro-ro passenger ships and advise MSC 93 accordingly.

13.4 The Sub-Committee had for its consideration document SDC 1/13 (Germany), stating that the current regulations and guidelines do not require the mandatory application of evacuation analysis to non-ro-ro passenger ships, and summarising the decisions and discussion under consideration from the outcome of MSC 92 and the results of the Working Group on Passenger Ship Safety (MSC 92/WP.8/Rev.1). In the same document it was also proposed the establishment of a correspondence group at this session to progress the work on this output, based on the draft terms of reference contained in paragraph 12 of document SDC 1/13.

13.5 Following discussion, the Sub-Committee, noting the full support for document SDC 1/13, agreed that amendments to SOLAS to make the application of evacuation analysis to new and existing passenger ships mandatory are necessary and requested the Secretariat, with the assistance of interested delegations, to prepare a justification to expand the scope of this output for consideration by the Sub-Committee. In this connection, the Sub-Committee also requested the Secretariat to also prepare draft terms of reference for a correspondence group.

Justification to expand the scope of work on the existing output

13.6 Having considered the draft justification and proposed terms of reference prepared by the Secretariat (SDC 1/WP.8), the Sub-Committee noted the views expressed by several delegations that more time is needed to consider the draft justification in detail. Taking into account the time constraints at this session, it decided to further consider whether to expand the scope of this output at SDC 2. In this regard, the delegations of the Bahamas and the United Kingdom, not wishing to delay this work item, expressed their readiness to co-sponsor a document with a justification to expand the scope of work for this output. Subsequently, Member Governments and international organizations were invited to submit comments and proposals to SDC 2.

Extension of the target completion year

13.7 Taking into account the instructions of MSC 92, the Sub-Committee invited the Committee to note the above outcome and to extend the target completion year to 2015.

14 DEVELOPMENT OF AMENDMENTS TO THE CRITERION FOR MAXIMUM ANGLE OF HEEL IN TURNS OF THE 2008 IS CODE

General

14.1 The Sub-Committee recalled that SLF 55, having considered the part of the report of the IS Working Group (SLF 55/WP.3) dealing with the matter and, having noted that due to time constraints the group had been unable to consider the draft amendments to chapter 3 of part A of the 2008 IS Code, invited Member Governments and international organizations to submit comments and proposals on the draft amendments (SLF 55/12, annex) to this session.

Proposed amendments to the 2008 IS Code

14.2 In considering the proposed amendments to the 2008 IS Code on this matter, the Sub-Committee had for its consideration the following documents:

- .1 SDC 1/14 (Japan), commenting on document SLF 55/12, expressing concerns about the amendment proposal and entering into a discussion on the mandatory requirement without actual ship data from full scale trials; and concluding that the amendment is not necessary as a result of examination of actual trial data obtained with respect to a cruise ship and three ro-pax ships; and
- .2 SDC 1/14/1 (Poland), containing a proposal for the structure of the criterion for the maximum angle of heel in turns of the 2008 IS Code to be in line with that developed by SLF 51 within the framework for the second generation intact stability criteria; and, additionally, proposing to consider the transient maximum angle of heel caused by the turning manoeuvre instead of "steady state" heel as it is used in the 2008 IS Code.

14.3 Having considered the aforementioned documents and noted the views expressed on the need to further consider the proposed amendments, the Sub-Committee invited Member Governments and international organizations to submit comments to SDC 2.

Extension of target completion year

14.4 The Committee was invited to extend the target completion year to 2015.

15 DEVELOPMENT OF AMENDMENTS TO PART B OF THE 2008 IS CODE ON TOWING, LIFTING AND ANCHOR-HANDLING OPERATIONS

General

15.1 The Sub-Committee recalled that SLF 55 had instructed the IS Correspondence Group (SLF 55/17, paragraphs 3.14 and 10.8) to further consider the proposed amendments to the 2008 IS Code concerning towing, lifting and anchor-handling operations.

Report of the correspondence group

15.2 The Sub-Committee considered the relevant part of the report of the correspondence group (SDC 1/5) and, having approved it in general, noted that the group prepared the following draft amendments to the 2008 IS Code:

- .1 proposed amendments common to all the operational modes, with special emphasis on chapters 3 and 4 of part B of the 2008 IS Code (annex 3);

- .2 proposed amendments to chapter 2 of part B of the 2008 IS Code regarding vessels engaged in anchor-handling operations (annex 4);
- .3 proposed amendments to chapter 2 of part B of the 2008 IS Code regarding vessels engaged in towing operations (annex 5); and
- .4 proposed amendments to chapter 2 of part B of the 2008 IS Code regarding vessels engaged in lifting operations (annex 6).

15.3 In this connection, the Sub-Committee also noted that the group discussed the inclusion of provisions for escort towing in the draft amendments to part B of the 2008 IS Code. However, as it was considered that this might be outside the terms of reference for the group, provisions related to escort towing were included in square brackets for consideration by the Sub-Committee, as appropriate.

15.4 In considering the group's report, the Sub-Committee, having noted the views expressed regarding matters related to escort towing, the stability criteria for lifting operations and possible unintended mandatory application of some provisions within part B of the 2008 IS Code, decided not to finalize the proposed amendments at this stage.

15.5 Subsequently, Member Governments and international organizations were invited to submit comments and proposals to SDC 2.

Extension of target completion year

15.6 In light of the above decision, the Committee was invited to extend the target completion year for this output to 2015.

16 GENERAL CARGO SHIP SAFETY

16.1 The Sub-Committee recalled that MSC 90, following consideration of document MSC 90/WP.7, and included in the 2012-2013 biennial agenda of the relevant sub-committees and in the provisional agenda for their forthcoming sessions output 5.2.1.7 on "Review of general cargo ship safety", with a target completion year of 2013, instructing the DE Sub-Committee to consider the relevant risk control options listed in annex 4 to document MSC 90/WP.7.

16.2 The Sub-Committee also recalled that DE 57 had noted that it had been instructed to further examine measures to strengthen the maintenance responsibilities for ship machinery in the context of implementing the Safety Management System (SMS) and ship survey requirements, as proposed in document MSC 89/17/1 (Argentina). However, due to lack of time, DE 57 had decided to defer consideration of this agenda item to SDC 2.

16.3 Following discussion on the proposal to establish an extended survey system for general cargo ships and to strengthen the maintenance responsibilities for ship machinery in the context of the SMS and ship survey requirements, the Sub-Committee noted the views expressed regarding the application of the IACS UR Z7, the positive outcome of a relative cost benefit assessment carried out by IACS and the possibility of administrative and economic burdens caused by extending the survey system.

16.4 Having agreed that more time was needed to consider the matter in detail, the Sub-Committee invited Member Governments and international organizations to submit comments and proposals to SDC 2.

Extension of target completion year

16.5 In light of the above decision, the Committee was invited to extend the target completion year for this output to 2015.

17 DEVELOPMENT OF INTERPRETATION OF SOLAS REGULATION II-2/13.6 ON MEANS OF ESCAPE FROM RO-RO SPACES

General

17.1 The Sub-Committee recalled that MSC 90, having agreed with the view of Sweden (MSC 90/25/16) that the text of regulation II-2/13.6 on means of escape from ro-ro spaces may contain vague wording leading to differing interpretations, agreed to include in the biennial agenda of the FP Sub-Committee and agenda for FP 56, an unplanned output to develop a relevant interpretation for SOLAS regulation II-2/13.6 on means of escape from ro-ro spaces.

17.2 The Sub-Committee also recalled that FP 56 had agreed that the interpretations proposed in document FP 56/22 (Sweden) needed further refinement, in particular relating to the level of safety of escape routes offered by the proposed interpretation, which should be carefully compared to that for other ship types, as prescribed by SOLAS chapter II-2; the definition of the term "normally employed", which in its proposed form may be applicable to a wider range of ship types than just ro-ro ships; and the inclusion of decks that can be hoisted.

17.3 The Sub-Committee further recalled that FP 56, subsequently, had decided to further consider the matter and invited Member Governments and international organizations to submit proposals and comments to that session.

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

- .1 SDC 1/17 (IACS), discussing the arrangements to facilitate the safe escape route from ro-ro spaces on cargo ships with respect to the draft interpretation of SOLAS regulation II-2/13.6 (FP 56/22), and providing proposed modifications to the draft text with a view to the uniform implementation of the interpretation in the future;
- .2 SDC 1/17/1 (Sweden), providing further comments and proposals on the proposals contained in document FP 56/22, taking into account the views expressed at FP 56 towards an interpretation regarding means of escape from ro-ro spaces on cargo ships; and
- .3 SDC 1/17/2 (Republic of Korea), proposing clarification of SOLAS regulation II-2/13.6 on means of escape from ro-ro spaces on cargo ships, and aiming to provide a clear understanding in order to develop a common interpretation of the terms "normally employed" and "safe escape."

17.5 In considering the above documents, the Sub-Committee, having noted the following views that:

- .1 any enhanced measures should be appropriate for the risks identified and be applied to new ships only;
- .2 one of the means of escape should be permanently protected against fire while open ladders could be used as a secondary means of escape;

- .3 EEBDs should be provided for all open escape ladders so that crew members have proper protection from smoke;
- .4 requiring continuous fire shelter is outside the scope of this output; and
- .5 escapes should be well marked, taking into account that some people do not know the routes for escape,

agreed that more time was needed to consider the matter in detail and invited Member Governments and international organizations to submit comments and proposals to SDC 2.

Extension of the target completion year

17.6 Subsequently, the Sub-Committee invited the Committee to extend the target completion year for this output to 2015.

18 CLASSIFICATION OF OFFSHORE INDUSTRY VESSELS AND CONSIDERATION OF THE NEED FOR A NON-MANDATORY CODE FOR OFFSHORE CONSTRUCTION SUPPORT VESSELS

General

18.1 The Sub-Committee recalled that DE 57 had established the Correspondence Group on Guidelines for Offshore Wind Farm Vessels, with terms of reference set out in paragraph 12.7 of document DE 57/25, and had instructed it to submit a report to this session.

18.2 The Sub-Committee, noting that document SDC 1/18/2 (CESA) had been submitted under this agenda item, decided to consider the aforementioned document under agenda item 19 (see paragraph 19.4.2).

Report of the correspondence group

18.3 The Sub-Committee considered the relevant part of the report of the correspondence group (SDC 1/18 and SDC 1/INF.11) and noted that the group prepared draft *Guidelines for offshore service craft (OSC) used in wind farm service* (SDC 1/INF.11, annex 1) and draft *Guidelines for offshore construction vessels (OCV) used in wind farm service* (SDC 1/INF.11, annex 2). The Sub-Committee also noted that the group was of the view that guidance is needed to address the specific operating conditions for wind farm vessels, and that further consideration is required on the structure and content of the aforementioned two draft Guidelines, to include such matters as personnel transfer/access, cargo and overnight accommodation. Additionally, further consideration should be given on how to reflect complications arising out of vessels being of non-Convention size and for vessels engaged on non-international voyages.

18.4 In the context of the above, the Sub-Committee further noted the relevant parts of document SDC 1/18/1 (Vanuatu), commenting on the report of the correspondence group on the classification of offshore industry vessels and supporting the development of a code for offshore construction support vessels (see also paragraph 19.4.1).

18.5 Following discussion, the Sub-Committee approved the report of the correspondence group in general and in particular:

- .1 endorsed the approach taken by the correspondence group on the draft Guidelines for wind farm vessels, including the main construction standards suggested in the draft guidelines; and

- .2 agreed on the need for further work to make progress towards fully meeting the goals identified in the correspondence group's terms of reference through a working group and/or correspondence group.

Instructions to the Working Group on Construction

18.6 Consequently, the Sub-Committee instructed the Working Group on Construction, established under agenda item 19 (Carriage of more than 12 industrial personnel on board vessels engaged in international voyages), taking into account the comments and decisions made in plenary and documents SDC 1/18, SDC 1/18/1 and SDC 1/INF.11, to:

- .1 finalize the different options for construction standards for wind farm vessels (e.g. what kind of guidelines should be developed and on what basis);
- .2 further develop the draft *Guidelines for offshore service craft (OSC) used in wind farm service*, based on annex 1 to document SDC 1/INF.11, taking into account document SDC 1/INF.14; and
- .3 further develop the draft *Guidelines for offshore construction vessels (OCV) used in wind farm service*, based on annex 2 to document SDC 1/INF.11.

Report of the Working Group on Construction

18.7 Having considered the part of the report of the Working Group on Construction (SDC 1/WP.6) dealing with this item, the Sub-Committee noted the group's discussions and decisions regarding the preparation and revision of the draft Guidelines for offshore service craft (OSCs) and draft Guidelines for offshore construction vessels (OCVs), as set out in paragraphs 18 to 26 of document SDC 1/WP.6. Part 2 of the working group's report will be prepared by the chairman of the group, in due course, for submission to SDC 2.

Establishment of a correspondence group

18.8 Subsequently, the Sub-Committee agreed to establish a Correspondence Group on Interim Guidelines for Offshore Wind Farm Vessels (see also paragraph 19.16), under the coordination of the United Kingdom,^{*} and instructed it, based on document SDC 1/WP.6 and part 2 of the working group's report, to:

- .1 further develop the draft Interim Guidelines for offshore service craft (OSC), taking into account paragraphs 18 to 22 of document SDC 1/WP.6;
- .2 further develop the draft Interim Guidelines for offshore construction vessels (OCV);

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- .3 further consider how the application of the OSC and OCV guidelines would cover non-Convention ships; and
- .4 submit a report to SDC 2.

19 CARRIAGE OF MORE THAN 12 INDUSTRIAL PERSONNEL ON BOARD VESSELS ENGAGED IN INTERNATIONAL VOYAGES

19.1 The Sub-Committee recalled that MSC 92, having considered a proposal by DE 57 (DE 57/25/Add.1, annex 10), taking into account document MSC 92/13/2 (United Kingdom), agreed to include, in the 2014-2015 biennial agenda of the SDC Sub-Committee and in the provisional agenda for SDC 1, an unplanned output on guidelines addressing the carriage of more than 12 industrial personnel on board vessels engaged on international voyages, with a target completion year of 2015.

19.2 The Sub-Committee also recalled that MSC 92 agreed to instruct the correspondence group established at DE 57 to consider guidelines for offshore wind farm vessels to include the new output in the scope of its work.

Report of the correspondence group and related submissions

19.3 The Sub-Committee considered the relevant part of the report of the correspondence group (SDC 1/18 and SDC 1/INF.11) and noted that the group had an in-depth discussion on matters related to the development of guidelines addressing the carriage of more than 12 industrial personnel on board vessels engaged on international voyages. From the discussions, the Sub-Committee was clear on the need for the definition of industrial personnel for all ship types (not only for specialized offshore industry vessels engaged in wind farms). In this context, the Sub-Committee also noted that there was some support in the group for the term "industrial personnel" to be aligned with the 2008 SPS Code's definition of "special personnel". However, there was a concern that industrial personnel should not just be incorporated in the "special personnel" definition, because the definition in the Code may suggest or support a view that such a person automatically becomes a seafarer, which is something that the industry would wish to avoid, and there is no basis to necessarily assume that every wind farm technician and similar offshore worker should automatically be regarded as a "seafarer". Consequently, although the special personnel definition and training requirements may be considered as a basis for "industrial personnel", the group agreed that the two definitions should remain as two categories.

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

- .1 SDC 1/18/1 (Vanuatu), commenting on the report of the correspondence group and expressing the view that a more robust description of the maritime training and experience of the embarked personnel is needed to allow for a more direct assessment of the operational risk involved in the designation of vessels that are fit for wind farm purposes, taking into account that the types of ship addressed by the 1983 SPS Code operate in a significantly different manner compared to OCVs and OSCs, especially with regard to time and distance from safe harbour, the safety training of "special persons" and manoeuvring in close proximity to offshore assets;
- .2 SDC 1/18/2 (CESA), presenting the view of CESA that it will be difficult to accomplish the goal of safely carrying more than 12 industrial personnel with vessels that are neither passenger ships nor cargo ships by means of minor modifications to the definitions in the existing IMO instruments; and

- .3 SDC 1/INF.14 (Germany), proposing an interim solution for the carriage of more than 12 persons on board a vessel "who are not carried on board in connection with the special purpose of that ship or because of special work being carried out aboard that ship", including a draft Code for the Construction, Equipment and Operation of Offshore Service Vessels.

19.5 In considering the above documents, the Sub-Committee, having noted that there was strong support for both a short- and long-term solution for addressing this issue and the proposals in document SDC 1/18/2, noted the views expressed within the correspondence group on the subject of industrial personnel (SDC 1/18, paragraphs 24 to 32), in particular the two approaches for dealing with the regulation of offshore shipping in paragraphs 26 and 27 of its report, and endorsed the intention for discussion to continue with such issues taken into consideration.

Establishment of the Working Group on Construction

19.6 Following discussion, the Sub-Committee established a Working Group on Construction (see also paragraph 18.6) and instructed it, taking into account the comments and decisions made in plenary and documents SDC 1/18, SDC 1/18/1, SDC 1/18/2, SDC 1/INF.11 and SDC 1/INF.14, to:

- .1 identify short- and long-term options for addressing the carriage of more than 12 industrial personnel on board vessels engaged in international voyages;
- .2 develop a definition of industrial personnel, taking into account generic requirements for physical abilities, education and training;
- .3 develop a plan of action, identifying the priorities, time frames and objectives for the work to be accomplished; and
- .4 consider whether there is a need to establish a correspondence group and, if so, prepare draft terms of reference for consideration by the Sub-Committee.

Report of the Working Group on Construction

19.7 Having considered the part of the report of the Working Group on Construction (SDC 1/WP.6) dealing with the agenda item, the Sub-Committee took action as outlined hereunder.

Definition of industrial personnel

19.8 The Sub-Committee noted that, in order to start discussing the short- or long-term options (see paragraphs 18.11 and 18.13) for addressing the carriage of more than 12 industrial personnel on board vessels engaged in international voyages, it was necessary to develop a draft definition of such personnel. In this regard, the Sub-Committee noted that the group agreed that the draft definition should be based on the proposal in document SDC 1/18/2 and address personnel being transported or accommodated on board.

19.9 Having also noted the discussions and deliberations of the group regarding the definition for industrial personnel and its future use (SDC 1/WP.6, paragraphs 4 to 9), the Sub-Committee noted that the group agreed to the draft definition as set out in annex 1 in document SDC 1/WP.6 with the understanding that the definition should be included into the pertinent instruments (e.g. draft guidelines on OSC and OCV).

Plan of action for addressing the carriage of more than 12 industrial personnel on board vessels engaged in international voyages

19.10 The Sub-Committee noted that the group discussed the issue on the best options for addressing the carriage of more than 12 industrial personnel on board vessels engaged in international voyages and agreed that a short-term option (solution) would be to incorporate the new definition of industrial personnel into the draft guidelines, i.e. OSCs and OCVs.

19.11 While the new definition of industrial personnel and the draft guidelines on wind farm vessels (OSCs and OCVs) will provide a short-term solution for the renewable energy sector, the Sub-Committee noted that there would still be a need to identify the appropriate design and construction standards for the carriage of more than 12 industrial personnel on international voyages in a broader context. The work on design and construction standards for OSCs in the renewable energy sector will be used as a basis in that broader context. In this connection, the Sub-Committee also noted that the draft definition of industrial personnel, once finalized, would be a key element to be included in a future MSC circular for the interpretation of SOLAS chapter I, part A, regulation 2(e)(i).

19.12 In the context of the guidelines addressing the carriage of more than 12 industrial personnel on board vessels engaged on international voyages (MSC 92/26, paragraph 23.19), the Sub-Committee noted that the group identified that the future development of the above-mentioned MSC circular containing the new definition for industrial personnel would need to be augmented with some guidance on how the definition should be used in practice (i.e. which ship types or ship design and construction standards that could be used for the carriage of those personnel). The group was also of the opinion that this augmentation could be achieved through the development of additional recommendations to support that MSC circular or by reviewing relevant aspects in existing IMO instruments that would be affected.

19.13 Regarding a long-term solution and based on the proposal to amend SOLAS as contained in document SDC 1/18/2, the Sub-Committee noted that the group was of the view that the new definition could be useful in making a contribution to any future revision of the SOLAS Convention. In this regard, the delegation of France expressed its reservation on the long-term solution since it did not include development of regulations for small passenger ships.

19.14 In considering the proposed short- and long-term solutions discussed by the group, the Sub-Committee recognized that the title of this agenda item makes no reference to passenger ships or cargo ships, which would indicate how such vessels are to be treated with regard to SOLAS chapter I, and this is one of the issues that needs to be resolved in order to agree on a way forward. It was also noted during the discussion that offshore vessels may not be on international voyages.

19.15 In this connection, the delegation of the Cook Islands made a statement that it was important to recognise that an IMO agreement that some cargo ship standards can be used for the carriage of larger numbers (more than 12) of industrial personnel off shore would be the only way of ensuring a consistent and rapid approach.

Instructions to the correspondence group

19.16 The Sub-Committee, recognizing that further work is necessary on this issue and noting the views expressed on the urgent need to complete this work by the target completion date, instructed the correspondence group established under agenda item 18 (see paragraph 18.8), based on document SDC 1/WP.6 and part 2 of the working group's report as the basis for the further work, to develop guidance on how the definition of industrial personnel should be used in practice.

20 DEVELOPMENT OF GUIDELINES FOR WING-IN-GROUND CRAFT

20.1 The Sub-Committee recalled that DE 57 had for its consideration document DE 57/14 (Russian Federation), proposing a substantial number of amendments to the *Interim Guidelines for wing-in-ground (WIG) craft* (MSC/Circ.1054 and Corr.1) and recommending a thorough analysis of WIG craft casualty reports to develop well-founded requirements and safety measures. However, due to time constraints, DE 57 decided to defer consideration of this agenda item to this session.

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

- .1 SDC 1/20 (France), presenting a proposal concerning the development of final *Guidelines for wing-in-ground (WIG) craft*, aimed at enhancing the safety of the goods and persons carried, and suggesting that the approach to be followed is strengthened regulations, applied in a sensible manner, to encourage development of future technologies, such as those of WIG craft;
- .2 DE 57/14 and SDC 1/20/1 (Russian Federation), providing a substantial number of amendments to the *Interim Guidelines for wing-in-ground (WIG) craft* (MSC/Circ.1054 and Corr.1) and specifically refining the definition of type "A" WIG craft; and
- .3 SDC 1/20/2 (China), commenting on documents DE 56/18 and DE 57/14 and providing proposals for amendments to the *Interim Guidelines for wing-in-ground (WIG) craft* (MSC/Circ.1054), based on the research carried out by China.

20.3 Following consideration, the Sub-Committee, having noted a general summary provided by the Republic of Korea on the accident that occurred in 2012 and the views expressed regarding the scope of application of the Interim Guidelines and the need to further amend them with a view to developing well-founded requirements and safety measures, requested the Secretariat to prepare a consolidated text of the Guidelines with the proposed amendments contained in documents DE 56/18 (Republic of Korea), DE 57/14, SDC 1/20, SDC 1/20/1 and SDC 1/20/2, for further consideration at SDC 2.

20.4 In light of the above decision, the Sub-Committee invited Member Governments and international organizations to submit comments and proposals on the aforementioned consolidated text to SDC 2.

21 CONSIDERATION OF IACS UNIFIED INTERPRETATIONS

General

21.1 The Sub-Committee recalled that this was a continuous item on its biennial agenda that had been established by MSC 78, so that IACS could submit any newly developed or updated unified interpretations for consideration of the Sub-Committee with a view to developing appropriate IMO interpretations, if deemed necessary.

Application of the Performance standard for alternative means of corrosion protection for cargo oil tanks of crude oil tankers (resolution MSC.289(87))

21.2 In considering document SDC 1/21 (IACS), providing in the annex to this document a copy of IACS UI SC 258 on the application of the *Performance standard for alternative means of corrosion protection for cargo oil tanks of crude oil tankers* (resolution MSC.289(87)), as

referred to in SOLAS regulation II-1/3-11, the Sub-Committee agreed to the draft Unified interpretation on the application of the *Performance standard for alternative means of corrosion protection for cargo oil tanks of crude oil tankers* (resolution MSC.289(87)), and the associated draft MSC circular, as set out in annex 6, for submission to MSC 93 for approval.

Application of the Performance standard for protective coatings for cargo oil tanks of crude oil tankers (PSPC-COT) (resolution MSC.288(87))

21.3 In considering document SDC 1/21/1 (IACS), providing in the annex to this document a copy of IACS UI SC 259 on the application of the *Performance standard for protective coatings for cargo oil tanks of crude oil tankers* (PSPC-COT) (resolution MSC.288(87)), as referred to in SOLAS regulation II-1/3-11, the Sub-Committee agreed to the draft Unified interpretation on the application of the *Performance standard for protective coatings for cargo oil tanks of crude oil tankers* (PSPC-COT) (resolution MSC.288(87)), and the associated draft MSC circular, as set out in annex 7, for submission to MSC 93 for approval.

Means of escape from machinery control rooms and main workshops

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

- .1 SDC 1/21/2 (IACS), seeking clarifications on the arrangement of a continuous fire shelter to a safe position outside the machinery space and the meaning of the term "main workshop" with respect to the draft amendments to SOLAS regulation II-2/13, approved by MSC 92; and
- .2 SDC 1/24/3 (Japan), proposing a modification to the draft amendments to SOLAS regulation II-2/13.4, approved by MSC 92.

21.5 In considering document SDC 1/21/2, the Sub-Committee noted the statement by the delegation of the Bahamas that, in its view, a "continuous fire shelter" means a route from a main workshop, or from an engine control room, which allows escape, without entering the machinery space, to a location outside the machinery space. Such a continuous fire shelter need not be a protected enclosure as envisaged by SOLAS regulation II-2/13.4.2.1.1. In addition, this delegation considered that a "main workshop" is a compartment enclosed on at least three sides by bulkheads or gratings, usually containing welding equipment, metalworking machinery and workbenches.

21.6 The Sub-Committee endorsed the above interpretations and invited IACS to submit a finalized unified interpretation to SDC 2, including the above definitions and the sketches set out in paragraph 5 of document SDC 1/21/2.

21.7 In considering document SDC 1/24/3, the Sub-Committee noted that there was no support at this stage. Nevertheless, further interpretations would be considered at SDC 2 when this matter could be reconsidered.

Clarifications on the Code on Noise Levels on Board Ships

21.8 The Sub-Committee considered document SDC 1/21/3 (IACS), seeking clarifications on the *Code on Noise Levels on Board Ships*, adopted by resolution MSC.337(91), which is expected to enter into force on 1 July 2014; in order to facilitate global and unified implementation of the Code.

21.9 Following discussion, the Sub-Committee agreed that no interpretations were necessary for paragraph 3.3.2 of the Noise Code on the issues discussed in paragraph 4 of document SDC 1/21/3, taking into account that:

- .1 while some delegations agreed with the understanding of IACS that "normal service speed" should be interpreted as meaning the "normal design service shaft speed", the text in the Code is clear that the noise measurements are to be taken at no less than 80% of the maximum continuous rating (MCR); and
- .2 the text in the Code is clear in that Administrations will give due consideration in relation to "special ship types" and "ships with special propulsion and power configuration", and therefore internationally agreed understandings of these terms are not appropriate.

21.10 With regard to the remaining clarifications contained in paragraph 5 to 12 of document SDC 1/21/3, the Sub-Committee, having agreed in general to the clarifications set out in paragraphs 5, 6, 8.2, 9, 10 and 12, invited IACS to submit a draft unified interpretation to SDC 2, taking into account the comments made at this session.

Fire integrity of boundaries of ro-ro/vehicle spaces

21.11 The Sub-Committee considered document SDC 1/21/4 (IACS), seeking clarification on the provisions on fire integrity of boundaries of ro-ro/vehicle spaces which were adopted by resolution MSC.338(91), which will enter into force on 1 July 2014, in order to facilitate global and unified implementation of these provisions.

21.12 Following discussion, the Sub-Committee invited IACS to submit a document on the matter to SDC 2, taking into account the comments made at this session.

Sill and coaming heights for openings on top of deckhouses and companionways

21.13 The Sub-Committee considered document SDC 1/21/5 (IACS), seeking clarification on the minimum height of sills and coamings for various openings on the top of deckhouses or companionways on the freeboard deck.

21.14 Following discussion, the Sub-Committee decided not to pursue an amendment to the LL Convention and Protocol as it was outside the scope of this output, whilst recognizing that a long-term solution on this issue was needed. In responding, the observer from IACS offered to provide technical assistance to any Member State wishing to take this matter forward to the Committee. Subsequently, the Sub-Committee invited IACS to submit a unified interpretation to SDC 2 as a short-term solution, which, based on the analysis and proposals provided in document SDC 1/21/5, also takes into account flush bolted access covers.

Unified interpretations of the Performance standard for protective coatings for dedicated seawater ballast tanks in all types of ships and double-side skin spaces of bulk carriers (resolution MSC.215(82)) (MSC.1/Circ.1465) – Alternative Systems

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

- .1 SDC 1/21/6 (IACS), providing reasoning why the unified interpretations relevant to section 8 (Alternative systems) of resolution MSC.215(82), and which DE 57 and MSC 92 decided not to include in the text of

MSC.1/Circ.1465, should be included in amendments to these unified interpretations; and

- .2 SDC 1/21/7 (Republic of Korea), providing views on the IACS Unified interpretations relevant to section 8 (Alternative systems) and pertaining to the *Performance standard for protective coatings for dedicated seawater ballast tanks in all types of ships and double-side skin spaces of bulk carriers* (PSPC) (resolution MSC.215(82)).

21.16 Following consideration, the Sub-Committee, having noted that there was not enough support at this stage to take action on this matter, invited IACS to submit an updated unified interpretation to SDC 2, taking into account the comments made at this session. In this connection, the delegation of Greece made a statement, the text of which is set out in annex 10.

22 BIENNIAL AGENDA AND PROVISIONAL AGENDA FOR SDC 2

Outcome of A 28

22.1 In considering matters related to the biennial agenda and provisional agenda, the Sub-Committee recalled that the Assembly, at its twenty-eighth session, approved the *Strategic Plan for the Organization (for the six-year period 2014 to 2019)* (resolution A.1060(28)) and the *High-level Action Plan and priorities for the 2014-2015 biennium* (resolution A.1061(28)).

Biennial status report and proposed provisional agenda for SDC 2

22.2 Taking into account the progress made at the session and the instructions of MSC 92, the Sub-Committee prepared the biennial status report of the Sub-Committee for the 2014-2015 biennium (SDC 1/WP.2, annex 1) and the proposed provisional agenda for SDC 2 (SDC 1/WP.2, annex 2), as set out in annexes 8 and 9, respectively, for consideration by MSC 93.

Correspondence groups established at this session

22.3 The Sub-Committee established correspondence groups on the following subjects, due to report to SDC 2:

- .1 intact stability (see paragraph 5.9);
- .2 subdivision and damage stability (see paragraph 7.18);
- .3 amendments to SOLAS regulation II-1/11 and development of associated guidelines to ensure the adequacy of testing arrangements for watertight compartments (see paragraph 9.12);
- .4 guidelines for use of Fibre-reinforced Plastic (FRP) within ship structures (see paragraph 11.8); and
- .5 classification of offshore industry vessels and a review of the need for a non-mandatory code for offshore construction support vessels and guidelines addressing the carriage of more than 12 industrial personnel on board vessels engaged on international voyages (see paragraph 18.8).

Working arrangements for the next session

22.4 The Sub-Committee agreed to establish at its next session working and/or drafting groups on the following subjects:

- .1 subdivision and damage stability (agenda items 7 and 8);
- .2 intact stability matters (agenda items 5, 14 and 15);
- .3 review of the recommendation on evacuation analysis for new and existing passenger ships (agenda item 13);
- .4 classification of offshore industry vessels and a review of the need for a non-mandatory code for offshore construction support vessels and guidelines addressing the carriage of more than 12 industrial personnel on board vessels engaged on international voyages (agenda items 18 and 19); and
- .5 amendments to SOLAS regulation II-1/11 and development of associated guidelines to ensure the adequacy of testing arrangements for watertight compartments (agenda item 9),

whereby the Chairman, taking into account the submissions received, would advise the Sub-Committee well in time before SDC 2 on the final selection of such groups.

Date of next session

22.5 The Sub-Committee noted that the second session of the Sub-Committee has been tentatively scheduled to take place from 16 to 20 February 2015.

23 ELECTION OF CHAIRMAN AND VICE-CHAIRMAN FOR 2015

23.1 In accordance with the Rules of Procedure of the Maritime Safety Committee, the Sub-Committee unanimously re-elected Mrs. A. Jost (Germany) as Chairman and Mr. N. Campbell (South Africa) as Vice-Chairman, for 2015.

24 ANY OTHER BUSINESS

Development of risk-based distance criteria for gas fuel tanks

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

- .1 SDC 1/24 (Norway), proposing amendments to the draft IGF Code related to location of LNG tanks, based on a possible risk-based approach to the distance criteria in section 5.3 of the draft IGF Code;
- .2 SDC 1/24/4 (Germany and CESA), presenting a proposal to harmonize the damage assumptions and subdivision requirements according to SOLAS regulation II-1/8 with regulation 5.3.4 of the draft IGF Code (BLG 17/8/1) providing both protection and flexibility;
- .3 SDC 1/24/5 (France), expressing the view, based on its known projects of LNG fuelled ships currently under development, that the drastic limitation criteria, as proposed by Norway, would allow the design of LNG fuelled ships with tanks in the upper part of the ship and for short sea shipping only;

- .4 SDC 1/24/6 (CLIA), commenting on Norway's proposal to develop risk-based distance criteria for gas fuel tanks for inclusion in the draft IGF Code (SDC 1/24), and expressing the view that certain elements of Norway's proposal regarding risk-based distance criteria need further detailed consideration, including matters related to capacity, placement of tanks and feasibility; and
- .5 SDC 1/24/7 (CESA), welcoming the Norwegian initiative to complement deterministic gas fuel tank location requirements of the draft IGF Code with a probabilistic concept. The discussion of the proposed provisions reveals, however, that the limit values are too strict to facilitate the use of gas fuel beyond short sea shipping applications.

Instructions to the Stability Working Group

24.2 Following discussion, the Sub-Committee, having agreed to take a risk-based approach, instructed the Stability Working Group established under agenda item 8 (see paragraph 8.5), taking into account comments and decisions made in plenary, to finalize, as a high priority, the draft amendments to section 5 of the draft IGF Code related to location of LNG tanks, taking into account documents SDC 1/24, SDC 1/24/4, SDC 1/24/5, SDC 1/24/6 and SDC 1/24/7.

Report of the Stability Working Group

24.3 Having considered the part of the report of the Stability Working Group (SDC 1/WP.5/Add.1) related to the matter, the Sub-Committee took the following action:

- .1 noted the group's divided views on the threshold values for the length of the fuel tanks in the deterministic part (section 5.3.4.3) and the value of f_{cn} in the probabilistic part (section 5.3.5.1) (SDC 1/WP.5/Add.1, paragraphs 43 to 44 and annex 3);
- .2 agreed to forward the two options on the threshold values for the length of the fuel tanks and f_{cn} with a view to referring the decision on the above threshold options (SDC 1/WP.5/Add.1, paragraphs 44 and 49 to 51 and annex 3) to MSC 94 for decision (allowing further validation of the threshold values meanwhile); and
- .3 endorsed the draft protective location criteria for LNG fuel tanks of sections 5.3.4 and 5.3.5 of the draft IGF Code (SDC 1/WP.5/Add.1, annex 3).

24.4 Subsequently, the Sub-Committee requested the Secretariat to refer the outcome on matters related to the IGF Code, together with annex 3 of document SDC 1/WP.5/Add.1, to MSC 94, for consideration and action, as appropriate.

Outcome of FSI 21 and MSC 92 – Consideration of casualty reports

24.5 The Sub-Committee considered document SDC 1/24/1 (Secretariat), reporting on the outcome of FSI 21 and MSC 92, and noted that MSC 92 endorsed the FSI 21 decision to forward the reports on the incidents of the **Commodore Clipper** (GISIS incident C0008451), **Lisco Gloria** (GISIS incident C0008391), **Pearl of Scandinavia** (GISIS incident C0008286), **CMA CGM Christophe Colomb** (GISIS incident C0008272-R01), and **Deepwater Horizon**, together with the analyses and comments made by the correspondence group (FSI 21/5), to the Sub-Committees for consideration under this item to advise MSC 93 on how to proceed.

24.6 In considering the above casualties, the Sub-Committee, having noted the statement by the delegation of the United States, which advised that delegation's intention to co-sponsor a document to MSC 93 on matters related to the **Deepwater Horizon** casualty, and the statement by the delegation of India, which proposed that a review of the MODU Code be undertaken in light of the aforementioned casualty, invited interested Member Governments and international organizations to submit proposals for new outputs to the Committee in accordance with the Guidelines on the organization and method of work.

Threshold values for asbestos

24.7 The Sub-Committee considered document SDC 1/24/2 (Secretariat), reporting on the outcome of MSC 92, and noted that, in the context of the review of the *2011 Guidelines for the development of the inventory of hazardous materials* (resolution MEPC.197(62)), MEPC 65 had requested MSC 92 to give consideration to a threshold value for asbestos for the purpose of listing it in the Inventory of Hazardous Materials. Subsequently, MSC 92 referred the issue for a detailed technical review to the Sub-Committee for reporting to MSC 93. In this context, the Sub-Committee was invited to consider the detectability of asbestos in asbestos containing materials (ACMs) and the availability of relevant test methods, and to provide guidance to MSC 93 regarding an adequate threshold value for the purpose of listing asbestos in the Inventory of Hazardous Materials, as required under regulation 5 of the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009.

24.8 The Sub-Committee noted the information by the delegation of Japan concerning the work of the MEPC Correspondence Group on Ship Recycling, which had submitted its report (MEPC 66/3) for consideration at the forthcoming MEPC 66. The group, having discussed the detectability of asbestos and the availability of relevant test methods, recognized that in national laws and regulations in various countries the determination of threshold values for asbestos had a close linkage with testing methods presently applied in these countries. Consequently, the group had agreed to a compromise proposal of 0.1% as the threshold value and a footnote including a reference to the UN recommendation "Globally Harmonized System of Classification and Labelling of Chemicals (GHS)" as the basis for the value and a relaxation clause allowing the 1% threshold to be applied, subject to this being recorded in the Material Declaration and the Inventory.

24.9 Following discussion, the Sub-Committee, having noted the support expressed by several delegations for the compromise proposal described in paragraph 24.8 above, endorsed the above proposal and requested the Secretariat to inform MEPC 66 and MSC 93 of this decision.

25 REVIEW OF CONDITIONS UNDER WHICH PASSENGER SHIP WATERTIGHT DOORS MAY BE OPENED DURING NAVIGATION AND DEVELOPMENT OF AMENDMENTS TO SOLAS REGULATION II-1/22 AND MSC.1/CIRC.1380

25.1 The Sub-Committee recalled that MSC 92, having considered the report of the Working Group on Passenger Ship Safety (MSC 92/WP.8/Rev.1) and document MSC 92/23/2 (Norway, Spain, United Kingdom and United States), the latter proposing to review the conditions under which watertight doors of passenger ships may be opened during navigation and to prepare amendments to MSC.1/Circ.1380 and SOLAS regulation II-1/22, as appropriate, had decided to include, in the 2014-2015 biennial agenda of the SDC Sub-Committee and the provisional agenda for SDC 1, an output on "Review of conditions under which passenger ship watertight doors may be opened during navigation and prepare amendments to SOLAS regulation II-1/22 and MSC.1/Circ.1380", with a target completion year of 2015.

25.2 Due to time constraints, the Sub-Committee could not consider this matter at this session and invited Member Governments and international organizations to submit comments and proposals to SDC 2.

26 ACTION REQUESTED OF THE COMMITTEES

26.1 The Maritime Safety Committee, at its ninety-third session, is invited to:

- .1 approve the draft new chapter XIV to SOLAS to make the Polar Code mandatory, subject to deciding on the text still remaining in square brackets throughout the draft Code, with a view to adoption at MSC 94 in conjunction with the adoption of the draft Polar Code (paragraphs 3.17 and 3.24 to 3.32 and annex 2);
- .2 consider the draft International Code for Ships Operating in Polar Waters (Polar Code), with a view to subsequent adoption, in conjunction with the adoption of the associated draft SOLAS amendments, taking into account that a number of provisions still remain in square brackets throughout the draft Code (paragraph 3.67 and annex 3) and, in particular, to:
 - .1 note that chapters 10 and 11 and paragraph 12.5 of the draft Code were forwarded to NCSR 1, for consideration with a view to finalization and submission directly to MSC 94 (paragraphs 3.60 and 3.52);
 - .2 note that chapter 8 and paragraphs 9.3.3.3.4.4, 9.3.3.3.4.5 and 9.3.3.4 of chapter 9 of the draft Code were forwarded to SSE 1, for consideration of the need for the development of new performance or test standards, with a request to forward any comments and proposals directly to MSC 93 (paragraph 3.57);
 - .3 note that all three alternatives for chapter 13, and the discussion on the level of qualifications for different ships and operations, were forwarded to HTW 1, for consideration and advise directly to MSC 93 (paragraph 3.58 and 3.59); and
 - .4 note the request that maximum resources be made available to resolve the remaining issues so that the draft Code can be adopted in conjunction with the associated draft SOLAS amendments (paragraph 3.69);
- .3 approve the draft TM.5 circular on Unified interpretations to the 1969 TM Convention, subject to a decision on the text in square brackets in the proposed unified interpretation for regulation 1(3) (paragraphs 4.9 and 4.16 and annex 4);
- .4 note that documents SDC 1/6 and SDC 1/INF.7 were forwarded to MSC 93 for consideration together with the report of the FSA Experts Group (MSC 93/6/2) (paragraph 7.11);
- .5 note that the recommendations forwarded by the Working Group on Passenger Ship Safety related to the survivability of passenger ships will be further considered at SDC 2 (paragraphs 7.13, 7.17 and 7.18);

- .6 approve the draft amendments to the 2011 ESP Code with a view to subsequent adoption (paragraph 10.5 and annex 5);
- .7 endorse the view that the background for the objectives in part A of SOLAS chapter II-2 should be reconsidered before deciding on the restricted use of Fibre-reinforced Plastics (FRP) materials within ships structures, taking into account that a correspondence group has been established to progress the work on this output (paragraphs 11.6 and 11.8);
- .8 note that the recommendation forwarded by the Working Group on Passenger Ship Safety to consider the mandatory application of evacuation analysis to non-ro-ro passenger ships will be further considered at SDC 2 (paragraphs 13.6 and 13.7);
- .9 note the progress made on matters related to the review of general cargo ship safety (paragraphs 16.3 to 16.5);
- .10 approve the draft MSC circular on Unified interpretation on the application of the *Performance standard for alternative means of corrosion protection for cargo oil tanks of crude oil tankers* (resolution MSC.288(87)) (paragraph 21.2 and annex 6);
- .11 approve the draft MSC circular on unified interpretation on the application of the *Performance standard for protective coatings for cargo oil tanks of crude oil tankers* (resolution MSC.288(87)) (paragraph 21.3 and annex 7);
- .12 approve the biennial status report of the Sub-Committee for the 2014-2015 biennium (paragraph 22.2 and annex 8);
- .13 approve the provisional agenda for SDC 2 (paragraph 22.2 and annex 9);
- .14 note that the Sub-Committee completed its review of the IGF Code, for matters referred to it by the BLG Sub-Committee, for referral to MSC 94 (paragraphs 24.3 and 24.4);
- .15 note the progress made on consideration of casualty reports forwarded by FSI 21 and MSC 92 (paragraph 24.6);
- .16 note that the Sub-Committee endorsed the compromise proposal agreed by the MEPC Correspondence Group on Ship Recycling (MEPC 66/3) regarding the threshold values for asbestos and forwarded its views to MEPC 66 (paragraphs 24.8, 24.9 and 26.2.3); and
- .17 approve the report in general.

26.2 The Marine Environment Protection Committee, at its sixty-sixth session, is invited to:

- .1 approve the draft amendments to MARPOL Annexes I, II, IV and V to make the Polar Code mandatory, subject to deciding on the text still remaining in square brackets throughout the draft Code, with a view to their adoption at MEPC 67 in conjunction with the adoption of the draft Polar Code (paragraphs 3.17 to 3.23 and annex 1);

- .2 consider the draft International Code for Ships Operating in Polar Waters (Polar Code), with a view to adoption in conjunction with the adoption of the associated draft MARPOL amendments, taking into account that a number of provisions still remain in square brackets throughout the draft Code (paragraphs 3.67 and annex 3) and, in particular, to:
 - .1 consider the discussion on port reception facilities, taking into account the relevant documents submitted to SDC 1, and take action as appropriate (paragraphs 3.42 and 3.43);
 - .2 consider the specific environmental issues raised by the Polar Code Working Group in its report (SDC 1/WP.4, paragraphs 41 to 47) and take action as appropriate (paragraphs 3.61 to 3.65);
 - .3 consider the certification and documentation requirements of the draft Polar Code (SDC 1/WP.4, paragraphs 49 and 50) and take action as appropriate (paragraph 3.66); and
 - .4 note the request to make maximum resources available to resolve the remaining issues so that the draft Code can be adopted in conjunction with the associated draft MARPOL amendments (paragraph 3.69).
- .3 note that the Sub-Committee endorsed the compromise proposal agreed by the MEPC Correspondence Group on Ship Recycling (MEPC 66/3), which will be considered at MEPC 66 (paragraphs 24.8 and 24.9).

ANNEX 1

**DRAFT AMENDMENTS TO MARPOL ANNEXES I, II, IV AND V
TO MAKE THE POLAR CODE MANDATORY¹**

DRAFT AMENDMENTS TO MARPOL ANNEX I

Regulation 1 – Definitions

1 The following is added at the end of regulation 1:

"39 *Polar Code* means the International Code for Ships Operating in Polar Waters, consisting of an introduction, part I-A [(the provisions of which should be treated as mandatory under the International Convention for the Safety of Life at Sea, 1974)] and part II-A [(the provisions of which shall be treated as mandatory under the relevant Annexes of the present Convention)] and part I-B [(the provisions of which should be treated as recommendatory)] and part II-B [(the provisions of which shall be treated as recommendatory)], as adopted by resolutions [MEPC....(...) and MSC....(...)], as may be amended by the Organization, provided that:

.1 amendments to [the environment-related provisions of] the introduction and chapter 1 of part II-A of the Polar Code are adopted, brought into force and take effect in accordance with the provisions of article 16 of the present Convention relating to amendment procedures applicable to an appendix to an annex.

.2 amendments to part II-B of the Polar Code are adopted by the Marine Environment Protection Committee in accordance with its Rules of Procedure.

40 *Polar waters* means both Arctic waters and the Antarctic area, as defined in the Polar Code."

Regulation 2 – Application

2 The following is added at the end of regulation 2:

"7 In addition to the provisions of this Annex, ships operating in polar waters shall comply with the requirements contained in [the environment-related provisions of] the introduction and chapter 1 of part II-A of the Polar Code".

Form A of Supplements to the IOPP Certificate under MARPOL Annex I

3 The following paragraph is added after the existing paragraph 2A.2:

"2A.3 The ship is required to be constructed according to part II-A, chapter 1, section 1.4 of the Polar Code and complies with the requirements of paragraph 1.4.2.2□"

¹ Further consequential amendments to the certificates under MARPOL Annexes may be needed subject to the final text of the Code and decisions of MEPC 66.

- 4 The following paragraphs are added after existing paragraph 5.2:
- "5.3 The ship is provided with a shipboard oil pollution emergency plan in compliance with regulation 37 and in compliance with paragraph 1.4.2.1 of part II-A of the Polar Code□
- 5.4 The ship is provided with a shipboard marine pollution emergency plan in compliance with regulation 37.3 and in compliance with paragraph 1.4.2.1 of part II-A of the Polar Code□"

Form B of Supplements to the IOPP Certificate under MARPOL Annex I

- 5 The following paragraph is added after the existing paragraph 2A.2:
- "2A.3 The ship is required to be constructed according to part II-A, chapter 1, section 1.4 of the Polar Code and complies with the requirements of paragraph 1.4.2.2□"
- 6 The following paragraphs are added after existing paragraph 8.2:
- "8.3 The ship is provided with a shipboard oil pollution emergency plan in compliance with regulation 37 and in compliance with paragraph 1.4.2.1 of part II-A of the Polar Code□
- 8.4 The ship is provided with a shipboard marine pollution emergency plan in compliance with regulation 37.3 and in compliance with paragraph 1.4.2.1 of part II-A of the Polar Code□"

DRAFT AMENDMENTS TO MARPOL ANNEX II

Regulation 1 – Definitions

- 1 The following is added at the end of regulation 1:
- "18 *Polar Code* means the International Code for Ships Operating in Polar Waters, consisting of an introduction, part I-A [(the provisions of which should be treated as mandatory under the International Convention for the Safety of Life at Sea, 1974)] and part II-A [(the provisions of which shall be treated as mandatory under the relevant Annexes of the present Convention)] and part I-B [(the provisions of which should be treated as recommendatory)] and part II-B [(the provisions of which shall be treated as recommendatory)], as adopted by resolutions [MEPC....(...) and MSC....(...)] as may be amended by the Organization, provided that:
- .1 amendments to [the environment-related provisions of] the introduction and chapter 2 of part II-A of the Polar Code are adopted, brought into force and take effect in accordance with the provisions of article 16 of the present Convention relating to amendment procedures applicable to an appendix to an annex.
- .2 amendments to part II-B of the Polar Code are adopted by the Marine Environment Protection Committee in accordance with its Rules of Procedure.

- 19 *Polar waters* means both Arctic waters and the Antarctic area, as defined in the Polar Code."

Regulation 2 – Application

- 2 The following is added at the end of regulation 2:
- "3 In addition to the provisions of this Annex, ships operating in polar waters shall comply with the requirements contained in [the environment-related provisions of] the Introduction and chapter 2 of part II-A of the Polar Code."

DRAFT AMENDMENTS TO MARPOL ANNEX IV

Regulation 1 – Definitions

- 1 The following is added at the end of regulation 1:
- "16 *Polar Code* means the International Code for Ships Operating in Polar Waters, consisting of an introduction, part I-A [(the provisions of which should be treated as mandatory under the International Convention for the Safety of Life at Sea, 1974)] and part II-A [(the provisions of which shall be treated as mandatory under the relevant Annexes of the present Convention)] and part I-B [(the provisions of which should be treated as recommendatory)] and part II-B [(the provisions of which shall be treated as recommendatory)], as adopted by resolutions [MEPC....(...) and MSC....(...)] as may be amended by the Organization, provided that:
- .1 amendments to [the environment-related provisions of] the introduction and chapter 4 of part II-A of the Polar Code are adopted, brought into force and take effect in accordance with the provisions of article 16 of the present Convention relating to amendment procedures applicable to an appendix to an annex.
- .2 amendments to part II-B of the Polar Code are adopted by the Marine Environment Protection Committee in accordance with its Rules of Procedure.
- 17 *Polar waters* includes both Arctic waters and the Antarctic area, as defined in the Polar Code."

Regulation 2 – Application

- 2 The following is added at the end of regulation 2:
- "3 In addition to the provisions of this Annex, ships operating in polar waters shall comply with the requirements contained in the [the environment-related provisions of] the introduction and chapter 4 of part II-A of the Polar Code."

DRAFT AMENDMENTS TO MARPOL ANNEX V

Regulation 1 – Definitions

1 The following is added at the end of regulation 1:

"19 *Polar Code* means the International Code for Ships Operating in Polar Waters, consisting of an introduction, part I-A [(the provisions of which should be treated as mandatory under the International Convention for the Safety of Life at Sea, 1974)] and part II-A [(the provisions of which shall be treated as mandatory under the relevant Annexes of the present Convention) and part I-B [(the provisions of which should be treated as recommendatory)] and part II-B [(the provisions of which shall be treated as recommendatory)], as adopted by resolutions [MEPC....(...)] and MSC....(...)] as may be amended by the Organization, provided that:

.1 amendments to [the environment-related provisions of] the introduction and chapter 5 of part II-A of the Polar Code are adopted, brought into force and take effect in accordance with the provisions of article 16 of the present Convention relating to amendment procedures applicable to an appendix to an annex.

.2 amendments to part II-B of the Polar Code are adopted by the Marine Environment Protection Committee in accordance with its Rules of Procedure.

20 *Polar waters* includes both Arctic waters and the Antarctic area, as defined in the Polar Code."

Regulation 2 – Application

2 The existing regulation is replaced by the following:

"1 Unless expressly provided otherwise, the provisions of this annex shall apply to all ships.

2 In addition to the provisions of this annex, ships operating in polar waters shall comply with the requirements contained in [the environment-related provisions of] the introduction and chapter 5 of part II-A of the Polar Code."

ANNEX 2

DRAFT AMENDMENTS TO SOLAS TO MAKE THE POLAR CODE MANDATORY

"CHAPTER [XIV] SAFETY MEASURES FOR SHIPS OPERATING IN POLAR WATERS

For the purpose of this chapter:

1 *Polar Code* means the International Code for Ships Operating in Polar Waters, consisting of an introduction, part I-A [(the provisions of which shall be treated as mandatory)] and part II-A [(the provisions of which should be treated as mandatory under the relevant annexes of the Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, 1973)] and parts I-B and II-B [(the provisions of which should be treated as recommendatory)], as adopted by resolutions [MSC....(...)] and MEPC....(...)], as may be amended by the Organization, provided that:

- .1 amendments to [the safety-related provisions of] the introduction and part I-A of the Polar Code are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the annex other than chapter I; and
- .2 amendments to part I-B of the Polar Code are adopted by the Maritime Safety Committee in accordance with its Rules of Procedure.

2 *Polar waters* means both Arctic waters and the Antarctic area, as defined in the Polar Code.

[3 For the purpose of this chapter, *all ships* means:

- [.1 any ship to which chapter I, regulation 3, applies; and]
- [.2 ships constructed before, on or after [date of entry in force].]

[4 *Ship constructed* means a ship the keel of which is laid or which is at a similar stage of construction.]

[5 *At a similar stage of construction* means the stage at which:

- .1 construction identifiable with a specific ship begins; and
- .2 assembly of that ship has commenced comprising at least 50 tonnes or 1% of the estimated mass of all structural material, whichever is less.]

Regulation 2 – Application

1 Unless expressly provided otherwise in the Polar Code, this chapter applies to all ships [engaged on international voyages,] operating in polar waters, in addition to any other applicable requirements of the present regulations.

2 For ships constructed before [date of entry into force] part I-A of the Polar Code applies no later than [date to be determined].

3 In applying part I-A of the Polar Code, consideration should be given to the additional guidance in part I-B of the Polar Code.

[4 Operational limitations may form the basis for deviations from any or all prescriptive safety measures with the exception of the operational requirements in chapters 2, 12, 13 and 14 of the Polar Code. When utilizing operational limitations as means for compliance with a prescriptive safety measure, the evaluation and approval of the design and arrangements shall be carried out in accordance with regulation 4 (Alternative design and arrangement).]

[5 Nothing in this chapter shall prejudice the rights or obligations of States under international law, as reflected in the 1982 United Nations Convention on the Law of the Sea.]

Regulation 3 – Requirements for ships operating in polar waters

1 A ship operating in polar waters shall comply with the requirements of the safety-related provision of the introduction, part I-A of the Polar Code and shall, in addition to the requirements of regulation I/7, I/8, I/9, and I/10, as applicable, be [surveyed and] certified, as provided for in that Code.

2 A ship operating in polar waters holding a certificate issued pursuant to the provisions of paragraph 1 shall be subject to the control established in regulations I/19 [and XI-1/4]. For this purpose, such certificates shall be treated as a certificate issued under regulation I/12 or I/13.

Regulation 4 – Alternative design and arrangement

1 The goal of this regulation is to provide a methodology for alternative design and arrangements for structure, machinery, and electrical installations, fire safety and life-saving appliances and arrangements.

2 Structural arrangements, machinery and electrical installation, fire safety design and arrangement measures and as well as life-saving appliances and arrangements may deviate from the prescriptive requirements set out in chapters 3, 6, 8 and 9 of the Polar Code, provided that the alternative design and arrangements meet the intent of the goal and functional requirements concerned and provide an equivalent level of safety to those chapters.

3 When alternative design or arrangements deviate from the prescriptive requirements of chapters 3, 6, 8 and 9 of the Polar Code, an engineering analysis, evaluation and approval of the design and arrangements shall be carried out based on the Guidelines approved by the Organization².

4 Any alternative design or arrangement deviating from the prescriptive requirements shall be recorded in the Polar Ship Certificate and the ship's Polar Water Operational Manual, as required by the Polar Code, also defining the technical and operational measures and conditions for the allowed deviation."

² Refer to the *Guidelines for the approval of alternatives and equivalents as provided for in various IMO instruments* (MSC.1/Circ.1455), the *Guidelines on alternative design for SOLAS chapters II-1 and III* (MSC.1/Circ.1212) and the *Guidelines on alternative design and arrangements for fire safety* (MSC/Circ.1002), as applicable.

ANNEX 3

**DRAFT INTERNATIONAL CODE FOR SHIPS OPERATING
IN POLAR WATERS**

*(The notes in parenthesis are not part of the text
but represent issues for further consideration)*

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PREAMBLE

1 [The international Code for Ships Operating in Polar Waters has been developed to supplement existing IMO instruments in order to increase the safety of ships' operation and mitigate its impact on the environment in the harsh, remote [complex] and vulnerable polar waters.]

2 [The Code acknowledges that the polar [environments] [water operation] [may] impose additional demands on ships, their systems and operation beyond the existing requirements of the International Convention for the Safety of Life at Sea (SOLAS), 1974, the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the 1978 Protocol relating thereto (MARPOL), as amended, and other relevant binding IMO instruments. Such additional demands [are] [result from] [related to] the environmental conditions, the remoteness of the operation and other [unique] factors that are of particular significance in polar waters.]

3 [The Code also acknowledges that [some] polar marine ecosystems are particularly vulnerable to ships operation. [The Code furthermore acknowledges that the potential rapid rate of change in addition to the severe multiple hazards in polar waters that [may], when acting together, present a synergistic risk level that is greater than the sum of the specific individual risks normally considered when evaluating risk mitigation measures.] [This enhanced or multiple effects have been taken into consideration in the development of the Code.]]

Alternative:

3 [The Code also acknowledges that polar ecosystems are vulnerable to human activities, including ship operation.]

4 Though the safety part (part I-A) of the Polar Code does not specifically refer to environmental protection, the relationship between the additional safety measures and the protection of the environment is acknowledged as any safety measure taken to reduce the probability of an accident to happen, will largely benefit the environment.

5 [While Arctic and Antarctic waters have [a number of] [some] similarities, there are also significant differences. Hence, although the Code is intended to apply as a whole to both Arctic and Antarctic, the legal and geographical differences between the two areas have been taken into account.]

(Note: To be revisited when the content of the Code is agreed to see if there are different requirements for the two areas in the Code.)

6 [The key principles for developing the Polar Code has been to use a risk-based approach in determining scope and to adopt a holistic approach [in mitigating identified risks to acceptable levels] [to minimize the consequences of identified risks.]]

[7 The Code addresses the safety of persons on board, ship and cargo and the prevention of pollution by ships [and also considers systems external to the ship such as communication capabilities, availability of information to the navigation systems, [traffic monitoring systems] as well as search and rescue and pollution response capabilities.]

8 Nothing in this Code shall be taken as conflicting with the United Nations Convention on the Law of the Sea, 1982, the Antarctic Treaty System and other international instruments applicable to polar waters.

INTRODUCTION

[Section 1] Goal

The goal of this Code is to provide for safe ship operation and the [protection of the polar environment] [prevention of pollution from ships] by addressing risks present in polar waters and not adequately mitigated by other instruments of the Organization.

[Section 2] Definitions

For the purpose of this Code, the terms used have the meanings defined in the following paragraphs. Terms used, but not defined in the Code, shall have the same meaning as defined in SOLAS and MARPOL.

2.1 *Antarctic area* means the sea area south of latitude 60° S (see figure 1)

2.2 [*Arctic waters* means those waters which are located north of a line from the latitude 58°00'0 N and longitude 042°00'0 W to latitude 64°37'0 N, longitude 035°27'0 W and thence by a rhumb line to latitude 67°03'9 N, longitude 026°33'4 W and thence by a rhumb line to Sørkapp, Jan Mayen and by the southern shore of Jan Mayen to the Island of Bjørnøya, and thence by a great circle line from the Island of Bjørnøya to Cap Kanin Nos and hence by the northern shore of the Asian Continent eastward to the Bering Strait and thence from the Bering Strait westward to latitude 60°N as far as Il'pyrskiy and following the 60th North parallel eastward as far as and including Etolin Strait and thence by the northern shore of the North American continent as far south as latitude 60°N and thence eastward along parallel of latitude 60°N, to longitude 56°37'1 W and thence to the latitude 58°00'0 N, longitude 042°00'0 W (see figure 2).]

(Note: Proposed changed and it is questioned if the figure matches the text ref. comment Vanuatu in round 4)

2.3 *Polar waters* includes both Arctic [waters] and Antarctic [waters] [area]

2.4 *The Antarctic Treaty System* means the Antarctic Treaty, the measures in effect under that Treaty, its associated separate international instruments in force and the measures in effect under those instruments.

2.5 *Category A ship* means ships designed for operation in polar waters at least in medium first-year ice, which may include old ice inclusions.

2.6 *Category B ship* means a ship not included in category A, designed for operation in polar waters in at least thin first-year ice, which may include old ice inclusions.

2.7 *Category C ship* means a ship designed to operate in open water or in ice conditions less severe than those included in categories A and B.

2.8 *First-year ice* means sea ice of not more than one winter growth developing from young ice with thickness from 0.3-2.0 metre.

2.9 *MARPOL* means the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the 1978 Protocol relating thereto (MARPOL), as amended.

2.10 *Mean Lowest Daily Low (Minimum) Temperature* means the mean value of lowest temperature during a year or the ship operation period of the low (minimum) temperature during a 24 hour period. The mean value is to be derived from at least [10] years of data.

2.11. *Medium first-year ice* means first-year ice of 70-120 cm thickness.

2.12 *Open water* mean a large area of freely navigable water in which sea ice is present in concentrations less than 1/10. No ice of land origin is present.

2.13 *Organization* means the International Maritime Organization.

2.14 *Polar Service Temperature (PST)* means a temperature at least [10°C] [2σ] below MDLT for the intended operation in polar areas.

2.15 *Polar Ship Certificate* means a certificate issued by the Administration or by an organization recognized by the Administration [indicating] [defining] the environmental conditions and operational capability for which the ship has been designed for operation in polar waters.

2.16 *Polar Water Operational Manual (PWOM)* means.....

2.17 [Sea ice means any form of ice found at sea which has originated from the freezing of sea water.]

2.18 *Ship intended to operate in low air temperature* means a ship which is intended to undertake voyages to or through areas where the Mean Lowest Daily Low (Minimum) Temperature (MDLT) is below -10°C .

2.19 SOLAS means the International Convention for the Safety of Life at Sea, 1974, as amended.

2.20 STCW means the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended.

Figures 1 and 2 from resolution A.1024(26) to be inserted here.
(Note: Svalbard is missing on the map in resolution A.1024(26))

[Section] 3 Sources of hazards

3.1 The Polar Code considers hazards which may lead to elevated levels of risk due to increased probability of occurrence, more severe consequences, or both:

- .1 ice as it may affect hull structure, stability characteristics, machinery systems, navigation, the outdoor working environment, maintenance and emergency preparedness tasks, and malfunction of safety equipment and systems;
- .2 experiencing topside icing, with potential reduction of stability and equipment functionality;
- .3 low temperature as it affects the working environment and human performance, maintenance and emergency preparedness tasks, material properties and equipment efficiency, human performance, survival time and performance of safety equipment and systems;

- .4 extended periods of darkness or daylight as it may affect navigation and human performance;
- .5 high latitude as it affects navigation systems, communication systems and the quality of ice imagery information;
- .6 remoteness and possible lack of accurate and complete hydrographic data and information, reduced availability of navigational aids and seamarks with increased potential for groundings compounded by remoteness, limited readily deployable SAR facilities, delays in emergency response and limited communications capability, with the potential to affect incident response;
- .7 potential lack of ship crew experience in polar operations, with potential for human error;
- .8 potential lack of suitable emergency response equipment, with the potential for limiting the effectiveness of mitigation measures;
- .9 rapidly changing and severe weather conditions, with the potential for escalation of incidents; and
- .10 the environment with respect to sensitivity to harmful substances and other environmental impacts and its need for longer restoration.

3.2 The risks level within polar waters may differ depending on the geographical location, time of the year with respect to daylight, ice-coverage, etc. Thus, the mitigating measures required to address the above specific hazards may vary within polar waters and may be different in Arctic and Antarctic waters

[Section] 4 Operational limitations

4.1 When applying for a Polar Ship Certificate, a [risk] assessment shall be provided listing the ship's operational capabilities and limitations.

The assessment shall take into consideration the following:

- .1 the anticipated range of operating conditions;
- .2 hazards as listed in section 3.1 above; and
- .3 additional hazards identified.

The assessment shall include information on identified operational limitations, plans or procedures or additional safety equipment necessary to satisfy the provisions of this Code and mitigate incidents with potential safety or environmental consequences.

[Section] 5 Structure of the Code

5.1 This Code consists of Introduction, part I and part II. The Introduction contains mandatory provisions applicable to both part I and part II. Part I is subdivided into part I-A, which contains mandatory provisions on safety measures, and part I-B containing recommendations on safety. Part II is subdivided into part II-A, which contains mandatory provisions on pollution prevention, and part II-B containing recommendations on pollution prevention.

5.2 Part I-A is mandatory in accordance with the relevant SOLAS chapter. Part II-A is mandatory in accordance with the relevant MARPOL Annexes.

[5.3 Mandatory provisions included in parts I-A and II-A assume that, unless expressly provided otherwise in this Code, requirements contained in mandatory IMO instruments, as applicable, are complied with.]

[5.4 Each chapter consists of the overall goal of the chapter and functional requirements to fulfill the goal. Where considered necessary, additional requirements have been included.]

Alternatively:

[5.4 The functional requirements of this part shall be achieved by ensuring compliance with the prescriptive requirements specified in each chapter, or by alternative design and arrangements which comply with [SOLAS chapter XIII regulation 6] and operational limitations which comply with [SOLAS chapter XII regulation 2*bis*]. A ship shall be considered to meet the functional requirements set out in this part when either:

- .1 the ship's design and arrangements comply with all the prescriptive requirements in each chapter;
- .2 part(s) of the ship's design and arrangements have been reviewed and approved in accordance with [SOLAS chapter XIII regulation 6] and [SOLAS chapter XII regulation 2*bis*] and the remaining parts of the ship comply with the relevant prescriptive requirements in each chapter.]

**PART I-A
SAFETY MEASURES**

CHAPTER 1 – GENERAL

[1.1 Application

Unless expressly provided otherwise, the requirements of this part shall apply to ships operating in polar waters.

Ships built prior to [date of entry into force] shall meet the requirements of the Code with the exceptions of part I-A, paragraphs 4.2.1.1, 4.4 and 10.3.2.4.3 by [date to be determined]]

[1.2 Definitions

In addition to the definitions included in the relevant SOLAS chapters and the introduction of this Code, the following definitions are applicable to this part]

1.2.1 *Conning position* means the stations in which the ship's steering control and devices for ahead or astern operations are located.

1.2.2 *Escort* means any ship with superior ice capability in transit with another ship.

1.2.3 *Escorted operation* means any operation in which a ship's movement is facilitated through the intervention of an escort.

1.2.4 *Habitable environment* means a ventilated environment that will protect against hypothermia.

1.2.5 *Icebreaker* means any ship whose operational profile may include escort or ice management functions, whose powering and dimensions allow it to undertake aggressive operations in ice-covered waters.

1.2.6 [*Ice breaking capability* means maximum thickness of level compact ice through which a ship is capable of moving continuously using full power at a minimum steady speed of about 2 knots (1 m/s). It is assumed that ice-bending strength is not less than 500 kPa and ice has natural cover about 20-25 cm deep.]

1.2.7 *Ice Class* means the notation assigned to the ship by the Administration or by an organization recognized by the Administration showing that the ship has been designed for navigation in sea-ice conditions.

1.2.8 [*Ice Navigator* means any individual who, in addition to being qualified [under the STCW Convention] [based on training and competencies outlined in the STW Guidelines], is specially trained and otherwise qualified to direct the movement of a ship in [or near] ice-covered waters [as set out in this Code.]]

1.2.9 *2008 IS Code* means the International Code on Intact Stability, 2008, as adopted by resolution MSC.267(85).

[1.2.10 *Maximum expected time of rescue* means the time adopted for the design of equipment and system that provide survival support. It shall never be taken as less than 5 days.]

[1.2.11 *Machinery Installations* means equipment and machinery and its associated piping and cabling, which is necessary for the safe operation of the vessel.]

1.2.12 *Polar Class (PC)* means the ice class assigned to the ship by the Administration or by an organization recognized by the Administration based upon IACS Unified Requirements.] (Note: Proposed moved to part I-B)

1.3 Certificate and survey

1.3.1 Every ship that is on a voyage that is in whole or in part in polar waters and to which this Code applies shall have on board a valid Polar Ship Certificate and a Polar Waters Operation Manual (PWOM) complying with chapter 2 and [approved by the Administration].

Alternatively:

[1.3.1 Every ship that is on a voyage that is in whole or in part in polar waters and to which this Code applies shall have on board a valid Polar Ship Certificate.]

1.3.2 The Polar Ship Certificate shall be issued after an initial or renewal survey to a ship which complies with the relevant requirements of this Code. The certificate referred to in this regulation shall be issued or endorsed either by the Administration or by any person or organization recognized by it in accordance with SOLAS regulation XI-1/1. In every case, that Administration assumes full responsibility for the certificate.

1.3.3 The Polar Ship Certificate shall be drawn up in the form corresponding to the model given in annex X to part A-I of this Code. If the language used is neither English, nor French nor Spanish, the text shall include a translation into one of these languages.

Alternatively:

[1.3.3 The Polar Ship Certificate shall be that of the model given in the annex 1 to the Code. If the language used is not English, French or Spanish, the text shall include a translation into one of these languages.]

1.3.4 Polar Ship Certificate endorsement and renewal survey dates shall be harmonized with those related to other SOLAS certificates. [Therefore, in passenger ships operating in polar waters, renewal surveys shall be carried out at the intervals required in SOLAS regulation II-1/7. In cargo ships, intermediate and renewal surveys shall be carried out at the intervals established in SOLAS regulations II-1/8, II-1/9 and II-1/10, as applicable.]

1.4 Performance standards

1.4.1 Unless expressly provided otherwise, ship systems and equipment addressed in this Code shall satisfy at least the same performance standards referred to in SOLAS.

1.4.2 For ships operating in low air temperature, systems and equipment required by this Code shall be fully functional at the polar service temperature.

[1.4.3 For ships operating in low air temperature, survival systems and equipment shall be certified to ensure its operation at polar service temperature during the maximum expected rescue time.]

[1.5 Review of the Code

1.5.1 The Code will be reviewed by the Organization at intervals preferably not exceeding [two/six years] to consider revision of existing requirements to take account of new developments in design and technology.

1.5.2 Where a new development in design and technology has been found acceptable to an Administration, that Administration may submit particulars of such development to the Organization for consideration for incorporation into the Code during periodical review.]

CHAPTER 2 – POLAR WATER OPERATIONAL MANUAL

2.1 Goal

The goal of this chapter is to provide the owner, operator, master and crew with sufficient information regarding the ship's operational capabilities and limitations in order to support their decision-making process.

2.2 Functional requirements

2.2.1 The Manual shall include the ship-specific capabilities and limitations in relation to the risk assessment required under section 3 of Introduction.

2.2.2 The Manual shall include or refer to specific procedures to be followed in normal operations and in order to avoid encountering conditions that exceed the ships capabilities.

2.2.3 The Manual shall include or refer to specific procedures to be followed in the event of incidents in polar waters.

2.2.4 The Manual shall include or refer to specific procedures to be followed in the event that conditions are encountered which exceed the ships' specific capabilities and limitations in paragraph 2.2.1.

2.2.5 The Manual shall include or refer to procedures to be followed when using icebreaker assistance, as applicable.

[Procedures, plans, and instructions for the key shipboard operations certified under the ISM Code, part 7 shall include all the identified polar water risks to the ship, personnel, and the environment]

[The Cooperation Plan required in SOLAS regulation V/7.3 shall include specific aspects of polar water operations.]

2.3 Regulations

2.3.1 In order to comply with the functional requirements of paragraph 2.2.1, the manual shall contain relevant information with the ship's capabilities and limitations for:

- .1 operation in ice, as applicable;
- .2 operation in low air temperatures, as applicable;
- .3 communication and navigation capabilities in high latitudes; and
- .4 voyage duration.

2.3.2 In order to comply with the functional requirements of paragraph 2.2.2, the manual shall include risk-based procedures for the following:

- .1 voyage planning to avoid ice and/or temperatures that exceed the ship's design capabilities or limitations;
- .2 arrangements for receiving forecasts of the environmental conditions;
- .3 means of addressing any limitations of the hydrographic, meteorological and navigational information available;
- .4 operation of equipment required under other chapters of this Code; and
- .5 implementation of special measures to maintain equipment and system functionality under low temperatures, topside icing and the presence of sea ice, as applicable.

2.3.3 In order to comply with the functional requirements of paragraph 2.2.3, the manual shall include risk-based procedures to be followed for:

- .1 contacting emergency response providers for salvage, SAR, spill response, etc. as applicable; and
- .2 in the case of ships intending to operate in ice, procedures for maintaining life support and ship integrity in the event of prolonged entrapment by ice.

2.3.4 In order to comply with the functional requirements of paragraph 2.2.4, the manual shall include risk-based procedures to be followed for measures to be taken in the event of encountering ice and/or temperatures which exceed the ships design capabilities or limitations.

2.3.5 In order to comply with the functional requirements of paragraph 2.2.5, the manual shall include risk-based procedures for monitoring and maintaining safety during operations in ice, as applicable, including any requirements for escort operations or ice breaker assistance. Different operational limitations may apply depending on whether the ship is operating independently or with icebreaker escort. Where appropriate, the PWOM should specify both options.

CHAPTER 3 – SHIP STRUCTURE

3.1 Goal

The goal of this chapter is to provide that the material and scantling of the structures retain their structural integrity based on global and local response due to environmental loads and conditions.

3.2 Functional requirements

3.2.1 In order to achieve the goal set out in 3.1 above, the following functional requirements are embodied in the regulations of this chapter as appropriate:

- .1 for ships intended to operate in low air temperature, materials used shall be suitable for operation at the ships polar service temperature.
- .2 in ice strengthened ships, the structure of the ship shall be designed to resist both global and local structural loads anticipated under the foreseen ice conditions.

3.3 Regulations

3.3.1 In order to comply with the functional requirements of paragraph 3.2.1.1 above, materials of exposed structures in ships and materials exposed to sea water, shall be approved by the Administration, or a recognized organization accepted by it, taking into account standards acceptable to the Organization³ or other standards offering an equivalent level of safety based on the polar service temperature.

3.3.2 In order to comply with the functional requirements of paragraph 3.2.1.2 above, the following apply:

- .1 Scantlings of category A ships shall be approved by the Administration, or a recognized organization accepted by it, taking into account standards acceptable to the Organization⁴ or other standards offering an equivalent level of safety.
- .2 Scantlings of category B ships shall be approved by the Administration, or a recognized organization accepted by it, taking into account standards acceptable to the Organization⁵ or other standards offering an equivalent level of safety.
- .3 Scantlings of ice strengthened category C ships shall be approved by the Administration, or a recognized organization accepted by it, taking into account acceptable standards adequate for the ice types and concentrations encountered in the area of operation.
- .4 Category C ships need not be Ice Strengthened if, in the opinion of the Administration, the ships' structure is adequate for its intended operation.

CHAPTER 4 – STABILITY AND SUBDIVISION

4.1 Goal

The goal of this chapter is to ensure provision of adequate stability and subdivision in intact and damaged conditions.

4.2 Functional requirements

4.2.1 In order to achieve the goal set out in paragraph 4.1 above, the following functional requirements are embodied in the regulations of this chapter, as appropriate:

- .1 Ships of category A and B constructed on or after [DD/MM/YYYY] shall have sufficient residual stability to sustain ice-related damages.
- .2 Ships shall have sufficient stability in intact condition when subject to ice accretion.

³ Refer to IACS UR S6 Use of Steel Grades for Various Hull Members – Ships of 90 m in Length and Above (2013) and IACS URI Requirements concerning Polar Class (2011).

⁴ Refer to Polar Class 1-5 of IACS URI Requirements concerning Polar Class (2011).

⁵ Refer to Polar Class 6-7 of IACS URI Requirements concerning Polar Class (2011).

4.3 Requirements

4.3.1 For ships operating in areas and during periods where ice accretion is likely to occur, the following icing allowance should be made in the stability calculations:

- .1 30 kg per square metre on exposed weather decks and gangways;
- .2 7.5 kg per square metre for projected lateral area of each side of the vessel above the water plane; and
- .3 the projected lateral area of discontinuous surfaces of rail, sundry booms, spars (except masts) and rigging of vessels having no sails and the projected lateral area of other small objects should be computed by increasing the total projected area of continuous surfaces by 5% and the static moments of this area by 10%.

4.3.2 Ships operating in areas and during periods where ice accretion is likely to occur should be:

- .1 designed to minimize the accretion of ice; and
- .2 equipped with such means for removing ice as the Administration may require; for example, electrical and pneumatic devices, and/or special tools such as axes or wooden clubs for removing ice from bulwarks, rails and erections.

4.3.3 Information on the ice accretion stipulated in the stability calculations shall be given in the Polar Water Operational Manual.

4.3.4 Ice accretion shall be monitored and appropriate measures taken to ensure that the ice accretion does not exceed the values given in the Polar Water Operational Manual.

4.4 Stability in damaged conditions

4.4.1 Ships of category A and B constructed on or after [DD/MM/YYYY] shall be able to withstand flooding resulting from hull penetration due to ice impact. The residual stability following ice damage shall be such that the factor s_i , as defined in SOLAS regulation II-1/7-2.2 and 2.3, has $s_i = 1$ for all loading conditions d_s , d_l and d_p as defined in SOLAS regulations II-1/2.10, 2.11 and 2.12. Damage stability GZ, Range and heel at equilibrium criteria contained in instruments applicable to ship types not included in SOLAS chapter II-1, part B should be substituted as the denominators to the GZmax and Range numerators, respectively, and heel at equilibrium used in the calculation of the K factor value in the $s_{final,i}$ formula for the purposes of calculating s_i .

4.4.2 The ice damage extent to be assumed when demonstrating compliance with paragraph 4.5.1 shall be such that:

- .1 longitudinal extent is $0.045 \times$ length of deepest ice waterline length if centred forward of the point of maximum beam on the waterline, and $0.015 \times$ length of waterline length otherwise;
- .2 transverse extent penetration depth is 760 mm measured normal to the shell over the full extent of the damage;

- .3 vertical extent is the lesser of 0.2 of draft at the upper ice waterline, or the longitudinal extent;
- .4 the centre of the ice damage may be located at any point between the keel and 1.2 times the deepest ice draft; and
- .5 the vertical extent of damage may be assumed to be confined between the keel and 1.2 times the deepest ice draft.

4.4.3 Damage as defined in paragraph 4.5.2 is to be assumed at any position along the side shell.

CHAPTER 5 – WATERTIGHT AND WEATHERTIGHT INTEGRITY

5.1 Goal

The goal of this chapter is to provide measures to maintain watertight and weathertight integrity.

5.2 Functional requirements

In order to achieve the goal set out in 5.1 above, all closing appliances and doors relevant to watertight and weathertight integrity of the ship shall remain functional.

5.3 Requirements

5.3.1 In order to comply with the functional requirements of paragraph 5.2 above, the following apply:

- .1 Means shall be provided to remove or prevent ice and snow accretion around hatches and doors.
- .2 If the hatches or doors are hydraulically operated, means shall be provided to prevent freezing or excessive viscosity of liquids.
- .3 Where appropriate, weathertight doors, hatches and closing devices should be designed to be operated by personnel wearing heavy winter clothing including thick mittens.

CHAPTER 6 – MACHINERY INSTALLATIONS

[For the purpose of this chapter, ships intended to operate in ice means ships that [are ice-strengthened in accordance with chapter 3] [or that are expected to encounter high concentrations of any type of ice].]

6.1 Goal

The goal of this chapter is to ensure that, machinery installations are capable of delivering the required functionality necessary for safe operation of ships.

6.2 Functional requirements

6.2.1 In order to achieve the goal set out in paragraph 6.1 above, the following functional requirements are embodied in the regulations of this chapter, as appropriate:

6.2.1.1 Machinery installations shall provide functionality under the anticipated environmental conditions, taking into account:

- .1 ice accretion and/or snow accumulation;
- .2 ice ingestion;
- .3 [freezing and]viscosities of liquids;
- .4 seawater intake temperature; and
- .5 snow ingestion.

6.2.1.2 In addition, ships intended to operate in low air temperatures, machinery installations shall provide functionality under the anticipated environmental conditions, also taking into account:

- .1 cold and dense inlet air;
- .2 material embrittlement; and
- .3 loss of performance of battery or other stored energy device.

6.2.1.3 For ships intended to operate in ice, machinery installations shall provide functionality under the anticipated environmental conditions, taking into account:

- .1 loads imposed directly by ice interaction; and
- .2 ice ingestion from sea water.

6.3 Regulations

6.3.1 In order to comply with the functional requirement of paragraph 6.2.1.1 above, the following apply:

- .1 Machinery installations and associated equipment shall be protected against the effect of ice accretion and/or snow accumulation, ice ingestion, freezing of liquids, seawater intake temperature through design or operational measures based on the assessment required by section 3 of the Introduction.
- .2 Working liquids shall be maintained in a viscosity range that ensures operation of the machinery.
- [.3 Searchlights are to be fitted with heating or provided with a cover, as well as with heating arrangements for the directional motor.]

6.3.2 In order to comply with the functional requirement of paragraph 6.2.1.2 above, exposed machinery and electrical installation and appliances shall function at the polar service temperature.

6.3.3 In order to comply with the functional requirement of paragraph 6.2.1.2.1 above, the following apply:

- .1 Means shall be provided to ensure that combustion air for internal combustion engines driving essential machinery is maintained at a temperature in compliance with the criteria provided by the engine manufacturer.

6.3.4 In order to comply with the functional requirement of paragraph 6.2.1.2.2 above, materials for machinery and its foundations shall conform to standards at least equivalent to those acceptable to the Organization⁶.

6.3.5 In order to comply with the functional requirements of paragraph 6.2.1.3.1 above, the following apply:

- .1 Scantlings of propeller blades, propulsion line, steering equipment and other appendages of category A shall be approved by the Administration, or a recognized organization accepted by it, taking into account standards acceptable to the Organization⁷ or other standards offering an equivalent level of safety.
- .2 Scantlings of propeller blades, propulsion line, steering equipment and other appendages of category B shall be approved by the Administration, or a recognized organization accepted by it, taking into account standards acceptable to the Organization⁸ or other standards offering an equivalent level of safety.
- .3 Scantlings of propeller blades, propulsion line, steering equipment and other appendages of ice-strengthened category C ships shall be approved by the Administration, or a recognized organization accepted by it, taking into account acceptable standards adequate with the ice types and concentration encountered in the area of operation.

6.3.6 In order to comply with the functional requirements of paragraph 6.2.1.3.2 above, seawater supplies for machinery systems shall be designed to prevent ingestion of ice⁹, or otherwise arranged to ensure functionality.

CHAPTER 7 – OPERATIONAL SAFETY

7.1 Goal

The goal of this chapter is to provide for safe working conditions during normal operations including outdoor duties.

7.2 Functional requirements

7.2.1 In order to achieve the goal set out in 7.1 above, the following functional requirements are embodied in the regulations of this chapter as appropriate:

⁶ Refer to IACS URI Requirements concerning Polar Class (2011).

⁷ Refer to Polar Class 1–5 of IACS URI Requirements concerning Polar Class (2011).

⁸ Refer to Polar Class 6–7 of IACS URI Requirements concerning Polar Class (2011).

⁹ Refer to MSC/Circ.504, *Guidance on design and construction of sea inlets under slush ice conditions*.

7.2.1.1 Measures shall be taken to provide personal protection and avoid injuries to persons on board under the anticipated environmental conditions, and when subjected to:

- .1 wind and snow; or
- .2 ice accretion.

7.3 Requirements

[In order to comply with the functional requirement of paragraph 7.2.1.1 above, a risk assessment required by applicable international instruments¹⁰ shall follow a hazard identification process¹¹ that takes into account the sources of hazards listed in section 2 of the Introduction. This shall be used to determine the potential need for additional measures to ensure the health and safety of persons on board.]

CHAPTER 8 – FIRE SAFETY/PROTECTION

8.1 Goal

The goal of this chapter is to ensure that fire safety systems and appliances are effective and operable, and that means of escape remain available so that persons on board can safely and swiftly escape to the lifeboat and liferaft embarkation deck under the expected environmental conditions.

8.2 Functional requirements

8.2.1 In order to achieve the goal set out in paragraph 8.1 above, the following functional requirements are embodied in the regulations of this chapter as appropriate:

- .1 all components of fire safety systems and appliances if installed in exposed positions shall be protected from ice accretion and snow accumulation;
- .2 local equipment and machinery controls shall be arranged so as to avoid freezing, snow accumulation and ice accretion and their location to remain accessible at all time;
- .3 the design of fire safety systems and appliances shall take into consideration the need for persons to wear bulky and cumbersome cold weather gear, where appropriate;
- .4 means shall be provided to remove or prevent ice and snow accretion from accesses; and
- .5 extinguishing media shall be suitable for intended operation.

8.2.2 For ships intended to operate in low air temperature, the following apply:

- .1 all components of fire safety systems and appliances shall be designed to ensure availability and effectiveness under the polar service temperature;

¹⁰ MLC 2006, regulation 4.3, ISM Code, etc.

¹¹ MSC-MEPC.2/Circ.3, *Guidelines on the Basic Elements of a Shipboard Occupational Health and Safety Programme*

- .2 materials used in exposed fire safety systems shall be suitable for the polar service temperature and service; and
- .3 all two-way portable radio communication equipment shall be operable at the polar service temperature.

8.3 Regulations

8.3.1 In order to comply with the requirement of paragraph 8.2.1.1, isolating and pressure/vacuum valves in exposed locations are to be protected from ice accretion and remain accessible at all time.

8.3.2 In order to comply with the requirement of paragraph 8.2.1.2, the following apply:

- .1 fire pumps including emergency fire pumps, water mist and water spray pumps shall be located in compartments maintained above freezing;
- .2 the fire main is to be arranged so that exposed sections can be isolated and means of draining of exposed sections shall be provided. Fire hoses and nozzles need not be connected to the fire main at all times, and may be stored in protected locations near the hydrants;
- .3 firefighter's outfits shall be stored in warm locations on the ship; and
- .4 where fixed water-based firefighting systems are located in a space separate from the main fire pumps and use their own independent sea suction, this sea suction is to be also capable of being cleared of ice accumulation.

8.3.3 In order to comply with the requirement of paragraph 8.2.2.1, portable and semi-portable extinguishers shall be located in positions protected from freezing temperatures, as practicable. Locations subject to freezing are to be provided with extinguishers capable of operation under the polar service temperature.

8.3.4 In order to comply with the requirement of paragraph 8.2.2.2, materials used in exposed fire safety systems shall be suitable for the polar service temperature and service.

CHAPTER 9 – LIFE-SAVING APPLIANCES AND ARRANGEMENTS

9.1 Goal

The goal of this chapter is to provide for safe escape, evacuation and survival.

9.2 Functional requirements

In order to achieve the goal set out in paragraph 9.1 above, the following functional requirements are embodied in the regulations of this chapter, as appropriate:

9.2.1 *Escape*

9.2.1.1 Exposed escape routes shall remain accessible and safe, taking into consideration the potential icing of structures and snow accumulation.

9.2.1.2 Survival craft and muster and embarkation arrangements shall provide safe abandonment of ship, taking into consideration the possible adverse environmental conditions during an emergency.

9.2.2 Evacuation

9.2.2.1 All life-saving appliances and associated equipment shall be functional under [the polar service temperature] and under the possible adverse environmental conditions during the maximum expected time of rescue.

9.2.2.2 Ships shall have means to ensure safe evacuation of persons, including safe deployment of survival equipment, when operating in ice-covered waters, or directly onto the ice, as applicable.

9.2.3 Survival

9.2.3.1 Adequate thermal protection shall be provided for all persons on board, taking into account the intended voyage, the anticipated weather conditions (cold and wind), and the potential for immersion in ice-covered water, where applicable.

9.2.3.2 Life-saving appliances and associated equipment shall take account of the potential of operation in long periods of darkness, taking into consideration the intended voyage.

9.2.3.3 Taking into account the presence of any hazards, as identified in section 1 (Introduction), resources shall be provided to support survival following abandoning ship, whether to the water, to ice or to land, for the maximum expected time of rescue. These resources shall provide:

- .1 a habitable environment;
- .2 protection of persons from the effects of cold, wind and sun;
- .3 space to accommodate persons equipped with thermal protection adequate for the environment;
- .4 means to provide sustenance;
- .5 safe access and exit points; and
- .6 means to communicate with rescue assets.

9.3 Requirements

9.3.1 Escape

In order to comply with the functional requirements of paragraph 9.2.1.1 above, the following apply:

- .1 for ships exposed to ice accretion, means shall be provided to remove or prevent ice and snow accretion from escape routes, muster stations, embarkation areas, survival craft, its launching appliances and access to survival craft;
- .2 exposed escape routes shall be arranged so as not to hinder passage by persons wearing suitable polar clothing; and

- .3 for ships intended to operate in low air temperatures, adequacy of embarkation arrangements shall be assessed, having full regard to any effect of persons wearing additional polar clothing.

9.3.2 Evacuation

In order to comply with the functional requirements of paragraph 9.2.2.1 above, the following apply:

- .1 where the functional requirements of this chapter are achieved by means of adding devices requiring a source of power, this source shall be able to operate independently of the ship's main source of power.

9.3.3 Survival

9.3.3.1 In order to comply with the functional requirements of paragraph 9.2.3.1 above, the following apply:

- .1 for passenger ships, a proper sized immersion suit or a thermal protective aid shall be provided for each person on board; and
- .2 where immersion suits are required, they shall be of the insulate type.

9.3.3.2 In order to comply with the functional requirements of paragraph 9.2.3.2 above, ships intended to operate in extended periods of darkness, searchlights suitable for continuous use to facilitate operation in ice shall be provided for each lifeboat.

9.3.3.3 In order to comply with the functional requirements of paragraph 9.2.3.3 above, the following apply:

- .1 no lifeboat shall be of any type other than partially or totally enclosed type; and
- .2 an assessment shall consider the need for ships to be provided with survival resources for use following abandonment, onto ice or land to maximize the probability of survival for the expected time of rescue.
- .3 Taking into account the assessment referred to in paragraph .2 above, appropriate survival resources, which address both individual (personal survival equipment) and shared (group survival equipment) needs, shall be provided, as follows:
 - .1 life-saving appliances and group survival equipment that provide effective protection against direct wind chill for all persons on board;
 - .2 personal survival equipment in combination with life-saving appliances or group survival equipment that provide sufficient thermal insulation to maintain the core temperature of persons subject to the minimum temperatures anticipated for the voyage; and
 - .3 personal survival equipment that provide sufficient protection to prevent frostbite of all extremities under the minimum temperatures anticipated for the voyage.

- .4 Whenever the assessment referred to in paragraph 9.3.3.3.1 identifies a potential of abandonment onto ice or land, the following apply:
- .1 group survival equipment shall be carried, unless an equivalent level of functionality for survival is provided by the ship's normal life-saving appliances;
 - .2 when required, personal and group survival equipment sufficient for 110% of the persons on board shall be stowed in easily accessible locations, as close as practical to the muster or embarkation stations;
 - .3 containers for group survival equipment shall be designed to be easily movable over the ice and be floatable;
 - .4 whenever the assessment identifies the need to carry personal and group survival equipment, means shall be identified of ensuring that this equipment is accessible following abandonment;
 - .5 if carried in addition to persons, in the survival craft, the survival craft and launching appliances shall have sufficient capacity to accommodate the additional equipment;
 - .6 passengers and the special personnel, if any, shall be instructed in the use of the personal survival equipment and the action to take in an emergency; and
 - .7 the crew shall be trained in the use of the personal survival equipment and group survival equipment.

9.3.3.4 In order to comply with the functional requirements of paragraph 9.2.3.3.4 above, adequate emergency rations shall be provided.

CHAPTER 10 – SAFETY OF NAVIGATION

10.1 Goal

The goal of this chapter is to provide appropriate nautical information and navigational equipment functionality for safe navigation.

10.2 Functional requirements

In order to achieve the goal set out in 10.1 above, the following functional requirements are embodied in the regulations of this chapter as appropriate:

10.2.1 *Nautical information*

10.2.1.1 Ships shall be equipped to receive up-to-date information including ice information for safe navigation.

10.2.1.2 Systems for providing reference headings and position fixing shall be suitable for the intended areas.

10.2.2 Navigational equipment functionality

The navigational equipment and systems shall be designed, constructed, and installed to retain their functionality under the expected environmental conditions in the area of operation.

10.3 Regulations

10.3.1 Nautical information

10.3.1.1 In order to comply with the requirements of paragraph 10.2.1 above, the following apply:

- .1 ships shall have equipment capable of receiving and displaying information on ice [thickness and concentration]; and
- .2 ships shall have two independent echo-sounding devices.

10.3.1.2 In order to comply with the requirements of paragraph 10.2.1.2 above, the following apply:

- .1 ships shall have two non-magnetic means to determine and display their heading. Both means shall be independent, and if energy-consuming, they shall be connected to the ship's main and emergency source of power and [to an individual Uninterruptible Power Supply UPS unit with a minimum operating duration of 30 minutes]; and
- .2 ships proceeding to latitudes over 80 degrees shall be fitted with at least one GNSS compass or equivalent.

10.3.2 Navigational equipment functionality

In order to comply with the requirements of paragraph 10.2.2.1 above, the following apply:

- .1 Ships intended to operate low air temperature shall be fitted with a suitable means to de-ice sufficient conning position windows to provide unimpaired forward and astern vision from conning positions.
- .2 The windows described in .1 shall be fitted with an efficient means of clearing melted ice, freezing rain, snow, mist and spray from outside and accumulated condensation from inside. A mechanical means to clear moisture from the outside face of a window shall have operating mechanisms protected from freezing or the accumulation of ice that would impair effective operation.
- .3 Means to prevent the accumulation of ice on antennas required for navigation, communication and safe operation shall be provided.
- .4 Ships shall be equipped with two remotely rotatable, narrow-beam search lights controllable from the bridge to provide lighting over an arc of 360 degrees. If such coverage is not possible to obtain, two supporting searchlights shall be placed one on each side of the bridge wing.

- .5 [For ships intended to operate in ice], the following apply:
- .1 where equipment required by SOLAS chapter V or this chapter have sensors that project below the hull, such sensors shall be protected against ice;
 - .2 [in category A ships [constructed on or after [date]] the bridge wings shall be enclosed or designed to protect navigational equipment and operating personnel; and
 - .3 ships that may be involved in operations with an icebreaker escort shall be equipped with a manually initiated flashing red light visible from astern to indicate when the ship is stopped. This light shall have a range of visibility of at least two (2) nautical miles, the horizontal and vertical arcs of visibility shall conform to the stern light specifications in COLREG.

CHAPTER 11 – COMMUNICATION

11.1 Goal

The goal of this chapter is to provide for effective communication for ships and survival craft during normal operation and in emergency situations taking into account operation in high latitude.

11.2 Functional requirements

In order to achieve the goal set out in 11.1 above, the following functional requirements are embodied in the regulations of this chapter as appropriate.

11.2.1 *Ship communication*

- 11.2.1.1 Two-way voice and data communications [reliable] at all points along the intended operating routes taking account of the limitations of shore stations [and available satellite communications] shall be provided [by the ship borne equipment];
- 11.2.1.2 Suitable means of communications shall be provided where escort and convoy operations are expected.
- 11.2.1.3 Appropriate communication equipment to enable telemedical assistance in polar areas shall be provided.

(Note: Need clarifications on what kind of telemedical assistance that is available/possible.)

11.2.2 *Survival craft communications capabilities*

- 11.2.2.1 [All [rescue boats] and lifeboats, whenever released, shall carry at least one equipment capable of transmitting and receiving GMDSS compatible communications suitable for, distress alerting, locating, [and on-scene communications.; and]
- 11.2.2.2 All [other] survival craft, whenever released [for evacuation], shall carry equipment suitable for [distress alerting and] locating.

11.3 Regulations

11.3.1 *Ship communication*

11.3.1.1 In order to comply with the functional requirements of paragraph 11.2.1.3 above, ships intended to provide icebreaking escort] shall be equipped with a special sound signaling system mounted to face astern to indicate escort and emergency manoeuvres to following ships as described in the International Code of Signals (10.3.1.2).

11.3.1.2 In order to comply with the functional requirements of paragraph 11.2.1.4 above, on-scene communications capability in ships, shall include [maritime VHF-DSC equipment. and equipment for voice communications with aircraft on 121.5 and 123.1 MHz. (10.3.1.1 for ships).

11.3.2 *Survival craft communications capabilities*

11.3.2.1 In order to comply with the functional requirements of paragraph 11.2.2.1 above, the following apply:

- .1 on-scene communications capability in lifeboats, shall include maritime VHF-DSC equipment and equipment for voice communications with aircraft on 121.5 and 123.1 MHz;
- .2 all rescue boats and lifeboats, shall carry on-scene communications equipment for use with rescue assets upon evacuation into the water or to ice or to land; and
- .3 [Distress alerting and locating equipment required by 11.2.2 shall include [EPIRBs SARTs and AIS-SARTs] [EPIRBs and search and rescue locating devices]_Such equipment shall conform to performance standards referred in SOLAS or other alternative equipment that is compatible with GMDSS and acceptable to the Administration.]

11.3.2.2 [Mandatory communications equipment for use in survival craft and rescue boats shall be capable of operation during the maximum expected time of rescue].

CHAPTER 12 – VOYAGE PLANNING

12.1 Goal

The goal of this chapter is to ensure that the Company, master and crew are provided with sufficient information to enable operations to be conducted with due consideration to safety of ship and persons on board [and, as appropriate, environmental protection.]

12.2 Functional requirements

In order to achieve the goal set out in 12.1 above, the voyage plan shall take into account the potential hazards of the intended voyage.

12.3 Requirements

In order to comply with the requirements of paragraph 12.2, the master shall consider a route through polar waters taking into account the following:

- .1 the procedures required by the PWOM;
- .2 any limitations of the hydrographic information and aids to navigation available;
- .3 current information on the extent and type of ice and icebergs in the vicinity of the intended route;
- .4 statistical information on ice and temperatures from former years;
- .5 places of refuge;
- .6 current information and measures to be taken when cetaceans are encountered relating to known areas with densities of [wildlife] [cetaceans] including seasonal migration areas¹²;
- .7 current information on relevant ships' routing systems, speed recommendations and vessel traffic services relating to known areas with densities of [wildlife] [cetaceans] including seasonal migration areas¹³;
- .8 national and international designated protection areas along the route; and
- .9 operation in areas remote from SAR capabilities¹⁴.

[12.5 Reporting

Prior to entering Polar waters, ships should report to a recognized position report system accessible by search and rescue authorities.]

CHAPTER 13 – [CREWING] [MANNING] [, TRAINING FAMILIARITY, AND CERTIFICATION AND TRAINING]

(Note: Alternative proposals included at the end of chapter 13)

13.1 Goal

13.1.1 The goal of this chapter is to ensure that ships are appropriately manned by adequately qualified, trained and experienced personnel.

¹² Refer to MEPC/Circ.674 on Guidance document for minimizing the risk of ship strikes with cetaceans.

¹³ Refer to MEPC/Circ.674 on Guidance document for minimizing the risk of ship strikes with cetaceans.

¹⁴ Refer to MSC.1/Circ.1184 on Enhanced contingency planning guidance for passenger ships operating in areas remote from SAR facilities and A.999(25) on *Guidelines on voyage planning for passenger ships operating in remote areas*.

13.2 Functional requirements

13.2.1 In order to achieve the goal set out in 13.1.1 above, the following functional requirements are embodied in the regulations of this chapter as appropriate:

- .1 The [crewing] [manning] of all ships in polar waters shall take account of the provisions listed in this chapter, and also of the relative lack of shore and support infrastructure which may be available to assist in any operations.
- .2 The ship's officers [and crew] shall be made familiar with cold weather survival.
- .3 The Company shall establish an appropriate training programme according to the tasks and responsibilities assigned to qualified personnel, particularly ship's deck and engine officers.
- [.4 Ice Navigator(s) shall be provided, as appropriate.]

[13.3 Ice Navigator qualifications and training

[13.3.1 The Ice Navigator shall have documentary evidence of having satisfactorily completed an approved training programme in ice navigation.]

13.3.2 Such a training programme shall provide knowledge, understanding and proficiency required for operating a ship in polar ice-covered waters, including recognition of ice formation and characteristics; ice indications; ice manoeuvring; use of ice forecasts, atlases and codes; hull stress caused by ice; ice escort operations; icebreaking operations and effect of ice accretion on vessel stability.

13.3.3 Qualifications of an Ice Navigator shall include documentary evidence of having completed on-the-job training, as appropriate, and may include simulation training.

[13.3.4 The Administration shall issue a certificate of Ice Watchkeeper to persons with a valid deck certificate who have also completed successfully the required course of study for Ice Navigators.]

13.4 Certification

13.4.1 The certificate of competency of these persons shall be endorsed for full accreditation as an Ice Navigator by the Administration on completion of 30 days experience as a deck watchkeeper while the ship is under way and making way in the presence of ice, and an additional 20 days in polar waters to obtain designation of Arctic or Antarctic Ice Navigator.

13.4.2 Endorsement shall be revalidated every five years. Endorsements may be revalidated once the bearer establishes that the person has had 30 days of Ice Navigator experience within the preceding five-year period. The Administration shall establish procedures for revalidation.]

13.5 Emergency preparedness¹⁵

13.5.1 In identifying potential emergency shipboard situations in accordance with ISM Code, part 8 provisions, the Company shall consider the influence and impact of the environmental conditions in polar waters.

13.5.2 The Company shall adopt measures in order to ensure the onboard training required by SOLAS regulations II-2/15.2.2 and III/19.4 is adequate for polar water navigation, including instructions and information for passengers in accordance with SOLAS regulation III/19.2.

13.5.3 Training manuals required by SOLAS regulations II-2/15.2.3 and III/35 shall be prepared taking into account polar water environmental conditions. Procedures, plans, and instructions for emergency preparedness shall include all aspects of ship operations in polar waters and, in particular, instructions or procedures on:

- .1 evacuation, survival craft launching, and survival in life-saving appliances at sea and on land (special instructions necessary to use ship's life-saving appliances in severe weather and sea conditions on ice or in a combination of water and ice cover);
- .2 cold weather survival at sea and on land (cold shock, hypothermia, first-aid treatment of hypothermia, and other appropriate first-aid procedures);
- .3 long periods of time on board in case of stacking on ice; and
- .4 communication and assistance procedures in case of navigation in remote areas where SAR service could be unavailable for long periods of time.

13.5.4 Onboard instruction and operation of the ship's evacuation, fire and damage control appliances and systems shall include appropriate cross training of crew members with appropriate emphasis on changes to standard procedure made necessary by operations in polar waters.

13.5.5 Training equipment shall be maintained in good condition. A number of sewing kits and replacement parts (buttons, bootlaces, etc.) shall be kept on board for the purpose of minor repairs to training kit items.

13.6 Drills

13.6.1 The Company shall adopt measures in order to ensure that drills on board required by SOLAS regulations II-2/15.2, III/19.3 and III/30 are suitable for polar water navigation and are documented and certified under the ISM Code provisions. In particular:

- .1 evacuation drill scenarios for crew members shall be varied so that different emergency conditions are simulated, including abandonment into the water, onto the ice if appropriate, or a combination of the two. Each evacuation drill shall include:

¹⁵ Emergency preparedness for environmental protection has not been included at this stage. Draft paragraph 14.2.2 in chapter 14 should be discussed first.

- .1 exercises in passenger control in cold temperatures, as appropriate;
 - .2 checking that all personnel are suitably dressed;
 - .3 donning of immersion suits or thermal protective clothing by appropriate crew members; and
 - .4 [testing of emergency lighting for assembling and abandonment; and] instruction in survival at sea and the use of the ship's life-saving appliances and survival kits.
- .2 [Rescue boat drills shall be conducted as far as reasonable and [practicable] with due consideration of the dangers of launching into polar ice-covered waters, if applicable.]¹⁶
 - .3 Fire drill scenarios shall vary each week so that emergency conditions are simulated for different ship compartments, with appropriate emphasis on those changes to standard procedures made necessary by operations in polar waters and low temperatures.
 - .4 [Damage control drill¹⁷ scenarios shall vary each week so that emergency conditions are simulated for different damage conditions with appropriate emphasis on those conditions resultant from operations in polar waters.]

CHAPTER 13 – MANNING AND TRAINING FAMILIARITY

(Proposal by Canada)

13.1 Goal

13.3.1 The goal of this chapter is to ensure that ships are appropriately manned by adequately qualified, trained and experienced personnel.

13.2 Functional requirements

13.2.1 In order to achieve the goal set out in 13.1.1 above, the following functional requirements are embodied in the regulations of this chapter as appropriate:

- .1 The master, mates, and officers in charge of a navigational watch shall have training and experience appropriate for the vessel's capabilities and intended operations, or be advised by another person on the bridge having such training and experience.
- .2 Chief Engineer and Second Engineer officers in charge of an engineering watch shall have training and experience appropriate for the vessel's capabilities and intended operations.

¹⁶ Drill frequency subject to the result of the discussion of the draft Polar Code (paragraph 13.2.5.1.3).

¹⁷ Damage control drills should be further clarified and their scope differentiated from the ones concerning military ships.

- .3 For all ships operating in low air temperature, the Company shall establish an appropriate training programme according to the tasks and responsibilities assigned to qualified personnel, taking into account the risks relevant to normal operations, in abnormal situations and in emergency situations in polar waters.

13.3 Requirements/regulations

13.3.1 In order to comply with the functional requirements of 13.2.1.1, the master, mates and officers in charge of a navigational watch shall be qualified as follows:

- .1 Except as provided for in .2, all ships engaged on voyages other than in open waters shall have on board at least one person qualified in accordance with regulation II/2 or II/3 of chapter 2 of the STCW Convention, and that have completed an advanced training for ships operating in polar waters.
- .2 All ice strengthened ships, other than tankers or passenger ships, that enter into an area of New or Nilas Ice (less than 10 cm thick) that is not deformed by ridges, and where no ice of land origin, second-year or multi-year ice is present shall have on board at least one person qualified in accordance with regulations II/1, II/2 or II/3 of chapter 2 of the STCW Convention, and that have completed a basic training for ships operating in polar waters
- .3 All tankers and passenger ships engaged on voyages in open water other than ice-free waters shall have on board at least one person qualified in accordance with regulation II/1, II/2 or II/3 of chapter 2 of the STCW Convention, and that have completed a basic training for ships operating in polar waters.
- .4 Ships that are on voyages for which measures have been put in place to ensure that all waters en route only in ice-free water do not require officers that have completed training for ship operating in polar waters.

13.3.2 The requirements of 13.3.1 may be satisfied if a person other than a member of the crew, qualified in accordance with regulation II/1, II/2 or II/3 of chapter 2 of the STCW Convention as appropriate, and that have completed a training for ships operating in polar waters at the appropriate level is on the bridge to provide advice.

13.3.3 Vessel operations [in ice] shall meet at all times section A-VIII/1 of the STCW Code with regards to hours of rest requirements for the persons qualified with training for ships operating in polar waters.

13.3.4 In order to comply with the functional requirements of 13.2.1.3, the Company training program shall include the following as appropriate:

- .1 Survival in cold weather at sea and on land
- .2 Use of personal and group survival equipment
- .3 Abandonment on ice
- .4 Firefighting in cold weather
- .5 Operation of machinery and equipment in cold weather and cold water

13.5 Emergency preparedness¹⁸

Canada agree to delete, as it should be covered in chapter 2 and in 13.2 and 13.3.

13.6 Drills

Canada does not believe this section is needed, the drills shall be conducted taking into consideration the training given for polar operations and the equipment on board.

CHAPTER 13 – [CREWING] [MANNING] [, TRAINING FAMILIARITY, AND CERTIFICATION AND TRAINING]

(Proposal by Argentina):

13.1 Goal

13.3.1 The goal of this chapter is to ensure that ships are appropriately operated and manned by adequately qualified, trained and experienced personnel.

13.2 Functional requirements

13.2.1 In order to achieve the goal set out in 13.1.1 above, the following functional requirements are embodied in the regulations of this chapter as appropriate:

- .1 Masters, officers in charge of a navigational watch and officers in charge of an engineering watch on board ships operating in polar waters shall have the relevant experience and training.
- .2 The ship's officers [and crew] shall be made familiar with cold weather survival.
- .3 The Company shall establish an appropriate training programme according to the tasks and responsibilities assigned to qualified personnel, taking into account the relevant risks during normal and emergency situations.
- .4 The Company shall consider the influence and impact of the environmental conditions in polar waters in its safety management system.

[13.3 Qualifications and training

Masters, officers in charge of a navigational watch and officers in charge of an engineering watch on board ships operating in polar waters shall be trained and certified in accordance with the provision of the STCW Convention.

¹⁸ Emergency preparedness for environmental protection has not been included at this stage. Draft paragraph 14.2.2 in chapter 14 should be discussed first.

CHAPTER 13 – CREW TRAINING AND CERTIFICATION *(Proposal by the United States)*

13.1 Goal

13.1.1 The goal of this chapter is to ensure that ships are manned by adequately qualified, trained and experienced personnel.

13.2 Functional requirements

13.2.1 Crew members shall be capable of performing their assigned duties with due consideration to shipboard procedures required by this Code and operations in low air temperatures and ice-covered waters, as applicable.

13.3 Regulations/requirements

13.3.1 In order to comply with the requirement of paragraph 13.2.1 above:

- .1 Every crew member on board ships intended to operate in low air temperatures shall receive training, taking into account any applicable requirements under the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978, as amended.
- .2 Every crew member shall be made familiar with the procedures and equipment contained or referenced in the Polar Water Operational Manual relevant to their assigned duties.
- .3 Every officer in charge of a navigational watch on board ships intended to operate in ice shall be trained in ice navigation taking into account any applicable requirements under the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978, as amended. A temporary ice pilot for each navigational watch holding an STCW ice navigation endorsement may be provided when ships operate in ice to satisfy this requirement.

(Note: Propose requirements be developed by HTW regarding on board familiarity training, drills, and STCW certifications.)

PART I-B
[ADDITIONAL GUIDANCE REGARDING THE PROVISIONS OF PART I-A]
[RECOMMENDATORY MEASURES]

Additional guidance to chapter 2

Recommendations for content of Ice/Polar Operational Manual (from DE 55/12/11 IACS)

In terms of structural design, a safe speed curves should to be considered:

- .1 GREEN – below and up to the safe speed with no deformation;
- .2 ORANGE – the area from the green to the allowable deformation; and
- .3 RED – the area above the allowable deformation speed.

(insert figure 2 in paragraph 11 of DE 55/12/11)

Safe distance curves should be considered as follows:

- .1 GREEN – the distance is at or beyond the safe stopping distance;
- .2 ORANGE – the distance is between the safe stopping distance and the stopping distance using astern engine movement; and
- .3 RED – the distance is less than the stopping distance with astern engine movement.

The typical contents of Ice Certificate are to include the following information:

- .1 Guidelines/User Manual What is a speed/ice curve?;
- .2 information required for use (ice thickness, concentrations, etc. and the source of the data);
- .3 how to use a speed/ice curve (allowable deformations, safety margins, etc.);
- .4 speed/Ice Curves Data plots for various generic ice conditions (escort, independent, ridges, ice pressure, etc.; and
- .5 recommendations Specific ship advice based on speed/ice curves.

(See also DE 55/12/22)

Guidance on navigation with icebreaker assistance

To achieve compliance with the functional requirements in paragraph 12.2.1.5 above:

- .1 while approaching to a starting point of the ice convoy to follow the icebreaker/icebreakers or in case of the escorting by icebreaker of one ship to the point of meeting with icebreaker, the ship establishes radio communication on the VHF channel 16 and acts in compliance with icebreaker's instructions;

- .2 the icebreaker rendering the icebreaker assistance of ship ice convoy commands ships in the ice convoy;
- .3 position of a ship in the ice convoy is determined by the icebreaker rendering the assistance;
- .4 ship within the ice convoy, in accordance with the instructions of the icebreaker rendering the assistance, establishes communication with the icebreaker by VHF channel indicated by the icebreaker;
- .5 the ship while navigating in the ice convoy has to ensure: compliance with the instructions of the icebreaker;
- .6 position in the ice convoy, speed and distance to a ship ahead as instructed by the icebreaker; immediate notification of the icebreaker of any difficulties to maintain the position within the ice convoy, speed and/or distance to any other ship in the ice convoy; and
- .7 immediate reporting to the icebreaker of any damage.]

In developing the ship's contingency plans ships should consider damage control measures arrangements for emergency transfer of liquids and access to tanks and spaces during salvage operations.

Additional guidance to chapter 3

The following issues could be included in the additional guidance, but they are not yet developed in detail:

- .1 guidelines for the applicability of the ship related to structural integrity and propulsion capability for sailing in ice-covered polar waters, and possible operational instructions for the master of the ship related to navigation in different ice conditions;
- .2 guidelines for determination of the minimum engine power of the ship for the anticipated operation of the ship in polar waters; and
- .3 a table indicating the approximate correspondence between the polar classes and other ice classes of classification societies and Administrations.

Table 2.1. Approximate correspondence between ice classes

Approximate correspondence between the polar classes for existing ships

[A table indicating the approximate correspondence of structural strength between the polar classes and other ice classes of classification societies and Administrations for category A ships is given in table 2.1 and category B ships in table 2.2.

Table 2.1. Approximate correspondence of structural strength between ice classes for category A ships

Class	Ice Class				
	PC1	PC2	PC3	PC4	PC5
IACS PC	PC1	PC2	PC3	PC4	PC5
ABS		A4	A3	A2	
DNV	POLAR-30	POLAR-20	ICE-15 POLAR-10	ICE-10 ICE-15	ICE-05
KR	PL-20 PL-30	ICE-15 PL-10	ICE-05 ICE-10		
GL		Arc3	Arc2	Arc1	
LR		AC2	AC1.5	AC1	
RS		Arc9/Arc8	Arc7	Arc6	
Notes					
1. It is required to assess the ship on a case-by-case basis.					
2. This table is prepared based on comparative bow shell plate thicknesses for typical ice class configurations and vessels. Consideration should be given to other scantlings, materials, machinery, steering and propeller requirements.					

Table 2.2. Approximate correspondence of structural strength between ice classes for category B ships

Class	Ice Class	
	PC6	PC7
IACS PC	PC6	PC7
FSICR	IA Super	IA
ABS	A1	A0
BV	IA Super	IA
CCS	B1*	B1
DNV	Ice 1A*	Ice 1A
GL	E4	E3
KR	1A Super	1A
LR	1AS FS	1A FS
NK	IA Super	IA
RINA	IAS	IA
RS	Arc5	Arc4
Note		
1. IACS Polar Classes are developed based on independent navigation in multi-year ice, whilst corresponding ice classes shown are developed based on navigation in the Northern Baltic in first-year ice conditions. Consideration should be given to the intended operation and measures included in the PWOM as appropriate, such as safe speeds in ice.		

Other ice classes will be assessed on a case-by-case basis.]

When abrasion and corrosion resistant coatings and claddings are used they shall be matched to the anticipated loads and structural response.

Additional guidance to chapter 8

Personal survival kits should be stored so that they may be easily retrieved in an emergency situation. Arrangements such as storage in dedicated lockers near the assembly stations may be considered.

(Note: Content to be added?)

Group survival kits should be stored so that they may be easily retrieved and deployed in an emergency situation. Any containers should be located adjacent to the survival craft and liferafts. Containers should be designed so that they may be easily moved over the ice and be floatable.

(Note: Content to be added?)

Additional guidance to chapter 10

Radars equipped with enhanced ice detection capability should be promoted used, in particular in shallow waters.

Additional guidance to chapter 12

In developing and executing a voyage plan ships should consider the following:

1. In the event that marine mammals are encountered, any existing best practices should be considered to minimize unnecessary disturbance.
2. Planning to minimize the impact of the ship's voyage where ships are trafficking near areas of cultural heritage and cultural significance.

PART II-A
POLLUTION PREVENTION MEASURES [ENVIRONMENTAL PROTECTION MEASURES]

CHAPTER 1 – PREVENTION OF OIL POLLUTION

1.1 Application

1.1.1 Unless expressly provided otherwise, ships operating in polar waters shall comply with the provisions included in this chapter.

[1.1.2 Ships built prior to [date of entry into force] shall meet the requirements of the Code with the exceptions of 1.4.2.2 by [date to be determined]].

1.2 Goal

The goal of this chapter is to provide for means to reduce and to the extent practicable prevent harmful environmental impacts from oil from ships, taking into account the particular environmental conditions and resilience capabilities in polar waters.

1.3 Functional requirements

In order to achieve the goal set out in paragraph 1.3 above, the following functional requirements are embodied in the regulations of this chapter as appropriate:

- .1 Plans, manuals, records and procedures and means shall be provided to avoid environmental impact from oil or oily mixtures during normal operation.
- .2 Ships shall be designed and have plans to minimize the risk of any environmental impact from oil or oily mixtures in case of an emergency situation, in particular one that may lead to an oil spill in ice-covered waters.

1.4 Requirements

1.4.1 In order to comply with the functional requirements in paragraph 1.4.1 above, the following apply:

- .1 any manuals and records required by MARPOL Annex I shall take into account operation in polar waters; and
- .2 any discharge into the sea of oil or oily mixtures from any ship shall be prohibited.

1.4.2 In order to comply with the functional requirements in paragraph 1.4.1.2 above, the following apply:

- .1 the shipboard oil pollution emergency plan required by MARPOL Annex I shall take into account operation in polar waters; and
- .2 for categories A and B ships, constructed on or after [date of entry into force], all tanks used for carriage of oil or oily mixtures shall be separated from the outer shell by a distance not less than 760 mm. Where this is not practicable, this requirement needs not to be met for tanks containing oil or oily mixtures carried in way of the machinery space with an individual capacity of 20 m³ or less.

CHAPTER 2 – PREVENTION OF POLLUTION FROM NOXIOUS LIQUID SUBSTANCES

2.1 Application

2.1.1 Unless expressly provided otherwise, ships operating in polar waters shall comply with the provisions included in this chapter.

[2.1.2 Ships built prior to [date of entry into force] shall meet the requirements of the Code with the exception of 2.4.2.2 by [date to be determined]].

2.2 Goal

The goal of this chapter is to provide for means to reduce and to the extent practicable prevent harmful environmental impacts from noxious liquid substances from ships, taking into account the particular environmental conditions and resilience capabilities in polar waters.

2.3 Functional requirements

In order to achieve the goal set out in paragraph 2.3 above, the following functional requirements are embodied in the regulations of this chapter as appropriate:

- .1 records, manuals and means shall be provided to avoid environmental impact from noxious liquid substances during normal operation; and
- .2 ships shall be designed and have plans to minimize the risk of environmental impact from noxious liquid substances in case of an emergency situation.

2.4 Requirements

2.4.1 In order to comply with the functional requirements in paragraph 2.3.1 above, the following apply:

- .1 the cargo record book and the Procedure and Arrangement Manual required by MARPOL Annex II shall take into account operation in polar waters; and
- .2 any discharge into the sea of noxious liquid substances, or mixtures containing these substances, is prohibited.

2.4.2 In order to comply with the functional requirements in paragraph 2.4.2 above, the following apply:

- .1 the shipboard marine pollution emergency plan for noxious liquid substances required by MARPOL Annex II shall take into account operation in polar waters; and
- .2 for categories A and B ships, constructed on or after [date of entry into force], all tanks used for carriage of noxious liquid substances shall be separated from the outer shell by a distance not less than 760 mm.

CHAPTER 3 – PREVENTION OF POLLUTION BY HARMFUL SUBSTANCES IN PACKAGED FORM

Kept blank intentionally.

CHAPTER 4 – PREVENTION OF POLLUTION BY SEWAGE FROM SHIPS

4.1 Application

4.1.1 Unless expressly provided otherwise, ships operating in polar waters shall comply with the provisions included in this chapter.

[4.1.2 Ships built prior to [date of entry into force] shall meet the requirements of the Code with the exceptions of 4.4.1.2 by [date to be determined]].

4.2 Goal

The goal of this chapter is to provide for means to reduce and to the extent practicable prevent harmful environmental impacts by sewage from ships, taking into account the particular environmental conditions and resilience capabilities in polar waters.

4.3 Functional requirements

In order to achieve the goal set out in paragraph 4.3 above, ships shall be operated to minimize the risk of environmental impact by discharge of sewage from ships.

4.4 Requirements

4.4.1 In order to comply with the functional requirements in paragraph 4.4 above, the following apply:

- .1 Subject to the provisions of MARPOL Annex IV, regulation 3, discharges of sewage within polar waters are subject to the following additional requirements in accordance with standards [approved by the Administration based upon guidelines developed by] [acceptable to] the Organization¹⁹:
 - .1 discharges of sewage that is comminuted and disinfected and permitted under MARPOL Annex IV, regulation 11.1.1 shall be at a distance of more than 3 nautical miles from any ice shelf or land-fast ice and shall be as far as practicable from areas of ice concentration exceeding 1/10;
 - .2 discharges of sewage that is not comminuted and disinfected and permitted under MARPOL Annex IV, regulation 11.1.1 shall be at a distance of more than 12 nautical miles from any ice shelf or land-fast ice and shall be as far as practicable from areas of ice concentration exceeding 1/10; and
 - .3 discharges of sewage permitted under MARPOL Annex IV, regulation 11.1.2 or MARPOL Annex IV, regulation 11.3 shall be as far as practicable from the nearest land, any ice shelf, land-fast ice or areas of ice concentration exceeding 1/10.

¹⁹ Refer to resolution MEPC.2(VI), resolution MEPC.159(55) or resolution MEPC.227(64) as applicable.

- .2 Discharge of sewage into the sea is prohibited from cargo ships of category A and B, constructed on or after [date of entry into force], and passenger ships constructed on or after [date of entry into force] except when such discharges have been treated by means of a type-approved sewage treatment plant based upon guidelines developed by the Organization²⁰. Such discharges shall be, as far as practicable, from the nearest land, any ice shelf, land-fast ice or areas of ice concentration exceeding 1/10.
- .3 Notwithstanding the requirements of paragraph 4.5.1, ships that operate in areas of ice concentrations exceeding 1/10 for extended periods of time may discharge sewage if such sewage has been treated by means of a [type-approved] sewage treatment plant [approved] based upon guidelines developed by the Organization²². Such discharge shall be subject to the approval of the Administration, [and shall be noted in the Polar Ship Certificate with supplemental operational information in the Polar Water Operations Manual.] (Note: TYPE-approval based upon guidelines is questioned)

CHAPTER 5 – PREVENTION OF POLLUTION BY GARBAGE

5.1 Application

5.1.1 Unless expressly provided otherwise, ships operating in polar waters shall comply with the provisions included in this chapter.

[5.1.2 Ships built prior to [date of entry into force] shall meet the requirements of the Code by [date to be determined]].

5.2 Goal

The goal of this chapter is to provide for means to reduce and to the extent practicable prevent harmful environmental impacts by discharge of garbage from ships, taking into account the particular environmental conditions and resilience capabilities in polar waters.

5.3 Functional requirements

In order to achieve the goal set out in paragraph 5.3 above, the following functional requirements are embodied in the regulations of this chapter as appropriate:

- .1 records and, plans shall facilitate the minimization of environmental impact by garbage; and
- .2 ships shall be operated to minimize the risk of environmental impact by garbage.

5.4 Requirements

5.4.1 In order to comply with the functional requirements in paragraph 5.4.1 above, any plans and records required by MARPOL annex V shall take into account operation in polar waters.

²⁰ Refer to the 2012 *Guidelines on implementation of effluent standards and performance tests for sewage treatment plants* (resolution MEPC.227(64)).

5.4.2 In order to comply with the functional requirements in paragraph 5.4.2 above, ships to which the requirements of MARPOL Annex V, regulation 6 do not apply shall comply with the following:

- .1 discharge of food waste is only permitted when the ship is en route and as far as practicable from the nearest land, but in any case not less than 12 nm from the nearest land, nearest ice shelf, or nearest land-fast ice and shall be as far as practicable from areas of ice concentration exceeding 1/10;
- .2 food waste shall be comminuted or ground and shall be capable of passing through a screen with openings no greater than 25 mm. Food wastes shall not be contaminated by any other garbage type;
- .3 food waste shall not be discharged onto the ice; and
- .4 discharge of animal carcasses within Arctic waters is prohibited.

PART II-B

[INFORMATION AND ADDITIONAL GUIDANCE TO PART II-A] [RECOMMENDATORY MEASURES]

GENERAL INFORMATION

Different from the Arctic, the Antarctic has been specifically regulated under various MARPOL Annexes prior to the entry into force of the Polar Code. Upon entry into force of the Polar Code, there will still be some differences in the environmental protection requirements for ships operating in the Antarctic and ships operating in the Arctic:

MARPOL Annex I

- 1 The Antarctic area was designated a special area under MARPOL Annex I.
- 2 Discharge requirements are contained in regulations 15 and 34 of the Annex.
- 3 Regulation 15.4 provides that any discharge into the sea of oil or oily mixtures from any ship shall be prohibited.
- 4 Requirements on the reception facilities in special areas are contained in regulation 38.
- 5 Regulation 43 prohibits the use or carriage of [certain] oils in the Antarctic area.

MARPOL Annex II

Regulation 13.8.2 prohibits any discharge into the sea of noxious liquid substances or mixtures containing such substances.

MARPOL Annex V

- 1 The Antarctic area was designated a special area under MARPOL Annex V.
- 2 Discharge requirements for special areas are contained in regulation 6 of the annex. Regulation 6.1.1 also provides that discharge of introduced avian products, including poultry parts, is not permitted in the Antarctic area unless it has been treated to make sterile.

MARPOL Annex VI

MARPOL VI exempts cargo ships having icebreaking capacity from EEDI requirements.

[1 Additional guidance to chapter 1

(Note: This part is proposed deleted)

In addition to the provisions contained in chapter 1 of this Code, ships shall comply with regulation 43 of MARPOL Annex I, which prohibits the use or carriage of heavy fuel oil in Antarctic area. [Ships may, on a voluntary basis, not use or carry heavy fuel oil in Arctic area.]

2 Additional guidance to chapter 5

To meet the discharge requirements of MARPOL Annex V, due consideration should be given to resolution MEPC.219(63) *2012 Guidelines for the implementation of MARPOL Annex V* and resolution MEPC.220(63) *2012 Guidelines for the development of garbage management plans*. Given that the discharge of animal carcasses is prohibited, consideration should be given to the management, treatment, and storage of animal carcasses and, as appropriate, any future guidelines developed by the Organization.

3 Miscellaneous additional guidance

3.1 Until the International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention) enters into force, the ballast water management provisions of the ballast water exchange standard, set out in regulation D-1, or the ballast water performance standard, set out in regulation D-2 of the BWM Convention should be considered as appropriate. The provisions of the *Guidelines for ballast water exchange in the Antarctic treaty area* (resolution MEPC.163(56)) should be taken into consideration.

3.2 In selecting the ballast water management system, attention should be paid to limiting conditions specified in the appendix of the Type Approval Certificate and the temperature under which the system has been tested, in order to ensure its suitability and effectiveness in polar waters.

3.3 Non-toxic biodegradable lubricants or water-based systems should be considered for stern tube bearings, stern seals, and other lubricated components located outside the underwater hull.

3.4 In order to minimize the risk of invasive aquatic species transfers via biofouling, measures should be considered to minimize the risk of more rapid degradation of anti-fouling coatings associated with polar ice operations. Reference is made in particular to resolution MEPC.207(62), *2011 Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species*.

Table: Example of matters related to anti-fouling systems taken into consideration by some ice going ships (This table is used by some operators of ice going ships)

	Hull	Sea Chest
Year round operation in ice-covered polar waters	Abrasion resistant low friction ice coating No anti-fouling system	Abrasion resistant coating Compliant with the AFS Convention. Thickness of anti-fouling system to be decided by ship owner.
Intermittent operation in ice-covered polar waters	Abrasion resistant low friction ice coating In sides above bilge keel max thickness of anti-fouling system 75 µm [to protect hull between application of anti-fouling system and next anticipated voyage to ice-covered waters]. In bottom area thickness to be decided by ship owner. Composition of anti-fouling system should be decided	Compliant with the AFS Convention. Thickness of anti-fouling system to be decided by ship owner.
Category B & C vessels	Compliant with the AFS Convention. Thickness of anti-fouling system to be decided by ship owner.	Compliant with the AFS Convention. Thickness of anti-fouling system to be decided by ship owner.

APPENDIX

Form of Certificate for Ships operating in Polar Waters

POLAR SHIP [SAFETY] CERTIFICATE

This Certificate is a supplement to the Passenger Ship Safety Certificate/Cargo Ship Safety Construction Certificate²¹

The certificate shall be supplemented by a Polar Water Operational Manual

(Official seal)

(State)

Issued under the provisions of the

International Convention for the Safety of Life at Sea, 1974,
as modified by the Protocol of 1988 relating thereto

under the authority of the Government of

(name of the State)

by _____
(person or organization authorized)

Name of ship
Distinctive number or letters
Port of registry
Gross tonnage
IMO Number²²

²¹ Delete as appropriate.

²² In accordance with *IMO ship identification number scheme* adopted by the Organization by resolution A.600(15).

THIS IS TO CERTIFY:

- 1 That the ship has been surveyed in accordance with the requirements of regulation I/7 of the *Safety of Life at Sea*.
- 2 That the survey showed that the ship complied with the requirements of the International Code for Ships operating in Polar Waters as a

Category A / B / C²³ ship as follows:

Ice class/ No Ice class ³	Minimum operational temperature °C	[Latitude]	Any other limitations	

- 3 The ships was/was not³ subjected to an alternative design and arrangements in pursuance of regulations(s) [XIII/6] of the *Safety of Life at Sea* Convention.
- 4 Document of approval of alternative design and arrangements for [structural integrity] machinery and electrical installations/fire protection/life-saving appliances and arrangements³ is/is not³ appended to this Certificate.
- 5 That an Exemption Certificate has/has not³ been issued.

This certificate is valid until

Completion date of the survey on which this certificate is based:
(dd/mm/yyyy)

Issued at
(Place of issue of certificate)

.....

(Date of issue)

.....

(Signature of authorized official
issuing the certificate)

(Seal or stamp of the issuing authority, as appropriate)

²³ Delete as appropriate.

ANNEX 4

DRAFT TM.5 CIRCULAR

**UNIFIED INTERPRETATIONS RELATING TO THE INTERNATIONAL CONVENTION ON
TONNAGE MEASUREMENT OF SHIPS, 1969**

1 The Maritime Safety Committee, at its sixty-third session (16 to 25 May 1994), agreed to a consolidated set of interpretations of the provisions of the International Convention on Tonnage Measurement of Ships, 1969 (TM.5/Circ.5).

2 The Maritime Safety Committee, at its [ninety-third session (14 to 23 May 2014)], having considered a proposal by the Sub-Committee on Ship Design and Construction, at its first session, approved the Unified interpretations of the International Convention on Tonnage Measurement of Ships, 1969 (the 1969 Tonnage Convention), as set out in the annex.

3 Member Governments are invited to use these Unified interpretations when applying the provisions of the 1969 Tonnage Convention.

4 This circular supersedes circular TM.5/Circ.5.

ANNEX

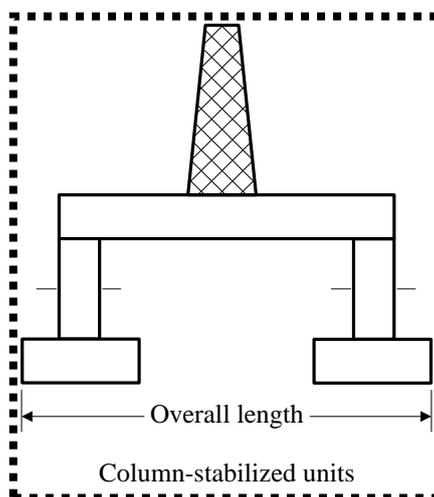
UNIFIED INTERPRETATIONS RELATING TO THE INTERNATIONAL CONVENTION ON
TONNAGE MEASUREMENT OF SHIPS, 1969

Articles

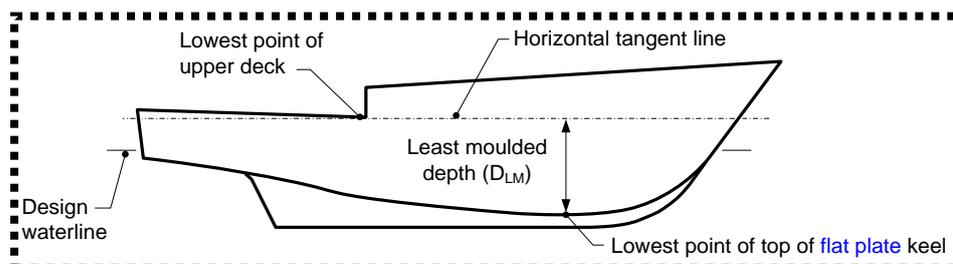
Art. 2 Definitions

Art. 2(8) Length

- A.2(8)-1 When a ship does not have a rudder stock, the length should be taken as 96% of the total length on a waterline at 85% of the least moulded depth measured as defined in regulation 2(2).
- A.2(8)-2 The 96% overall length should be used for ships that do not have a clearly defined stem or stern, such as column-stabilized units, submersibles, floating docks, and similar ships.



- A.2(8)-3 In the definition of "length" in article 2(8), the term "least moulded depth" is the vertical distance measured from the top of the flat plate keel (or equivalent lower terminus as described in regulation 2(2)) at the lowest point along the keel's length to the horizontal line that is tangent to the underside of the upper deck at the ship's side (or equivalent upper terminus as described in regulation 2(2)) at the lowest point along the upper deck's length. For the purpose of this definition, the ship is considered to be trimmed on a waterline parallel to the design waterline.



- A.2(8)-4 Where more than one rudder is fitted, the aftermost rudder stock is the rudder stock to be considered when determining the length.

Art. 3 Application

Art. 3(2)(d) Tonnage applicability to "existing" ships

- A.3(2)(d)-1 "The term "alterations or modifications which the Administration deems to be a substantial variation in their existing gross tonnage" means "an increase or decrease of more than 1% in the gross tonnage calculated in accordance with the 1969 Tonnage Convention.""

Art. 9 Form of certificate

Art. 9(2) Model in annex II

- A.9(2)-1 The "Date" shown on the front of the International Tonnage Certificate (1969) refers to the year when the keel was laid or the ship was at a similar stage of construction (article 2(6)) or the ship underwent alterations or modifications as defined in article 3(2)(b) but when the year of construction or alteration or modification is 1982 or 1994, the month and day should also be described.
- A.9(2)-2 Information inserted in the "location" columns on the reverse of the International Tonnage Certificate (1969) should not be detailed.
- A.9(2)-3 The phrase "Date and place of original measurement" should refer to the issue of the original International Tonnage Certificate (1969) and should have no reference to measurement under pre-existing national systems.
- A.9(2)-4 The phrase "Date and place of last previous remeasurement" should refer to the date and place of issue of the last International Tonnage Certificate (1969).

Art. 10 Cancellation of certificate

Art. 10(2) Cancellation upon flag transfer

- A.10(2)-1 Ships holding an International Tonnage Certificate (1969), which do not comply with agreed interpretations of the provisions of the Convention, should be remeasured. The new characteristics should be determined and applied without delay.

Art. 12 Inspection

- A.12-1 A copy of the tonnage calculations may be provided together with the International Tonnage Certificate (1969) to the ship's master. Although not a requirement, nothing in the Convention would prevent Administrations from providing these calculations to ships flying their flag.

Regulations

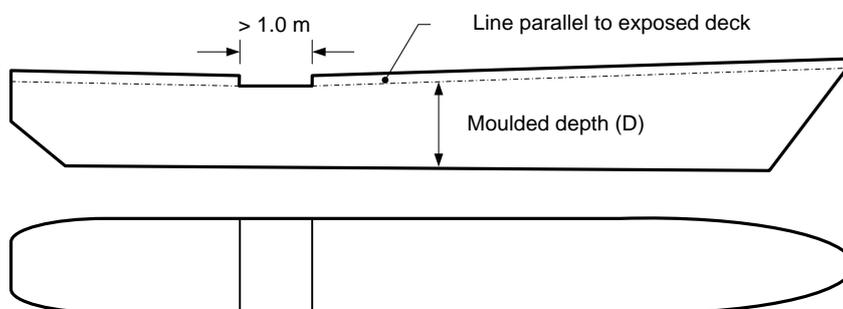
Reg. 1(3) General

- R.1(3)-1 [The right of the Administration to determine tonnage of novel types of craft by application of methods other than those provided in the regulations should not be construed to allow exempting from measurement of those enclosed spaces which would otherwise have been included in tonnage. In applying these novel craft provisions, the resulting gross and net tonnages should be reflective of the ship's overall size and useful capacity, respectively. As such, the phrase "render the application of the provisions of these regulations unreasonable or impractical" cannot be construed as permitting deviations from these regulations for reasons unrelated to the determination of the ship's overall size or useful capacity (e.g. to accommodate constructional features that increase a ship's enclosed volume without a corresponding increase in its tonnage for the purpose of avoiding adverse economic impacts).] A novel type of craft should be understood as one which is novel in its design and should not include existing traditional types of ships of usual shape or those types already covered by the Unified interpretations.

Reg. 2 Definition of terms used in the annexes

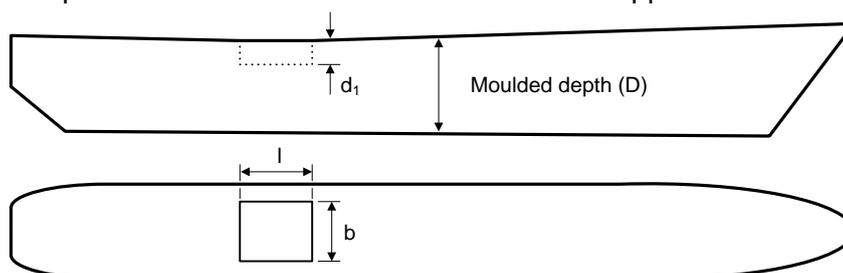
Reg.2(1) Upper deck

- R.2(1)-1 A discontinuity in the upper deck which extends over the full breadth of the ship and is in excess of 1 m in length should be treated as a step as defined in regulation 2(1).

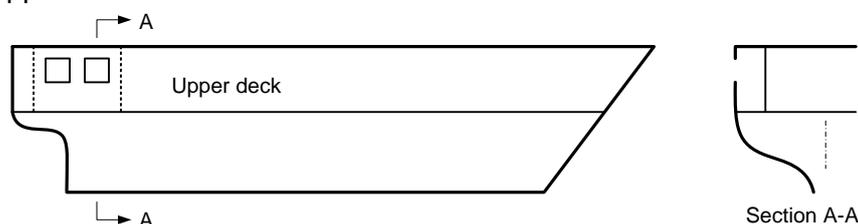


- R.2(1)-2 Steps situated outside the "length" (article 2(8)) should not be considered.

- R.2(1)-3 A discontinuity in the upper deck which does not extend to the side of the ship should be treated as a recess under the upper deck level.



- R.2(1)-4 In a ship having openings in the side of the ship below the uppermost deck, which are not closed but limited inboard by weathertight bulkheads and decks, the deck below such openings should be considered the upper deck.



- R.2(1)-5 The Administration may decide on the term "watertight" as a special definition for tonnage purposes is not needed.

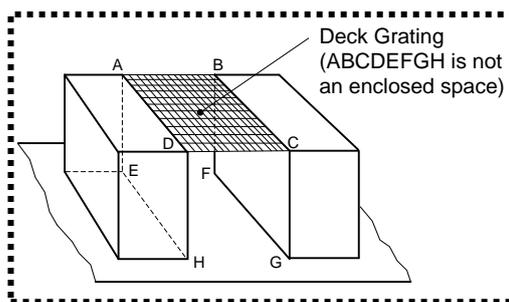
Reg. 2(3) Breadth

- R.2(3)-1 The term "amidships" should be considered as the midpoint of the length as defined in article 2(8) where the forward terminal of that length coincides with the fore side of the stem.

Reg. 2(4) Enclosed spaces

- R.2(4)-1 In regulation 2(4) there is no contradiction between the definition of enclosed spaces as being "bounded by the ship's hull, by fixed or portable partitions ... " and "... nor the absence of a partition or bulkhead, shall preclude a space from being included in the enclosed space".
- R.2(4)-2 Space located within the boundaries of "permanent or movable awnings" should be subject to treatment under regulation 2(5).
- R.2(4)-3 Tanks, permanently located on the upper deck, provided with removable pipe connections to the cargo system or the vent (de-airing) lines of the ship, should be included in V_c .
- R.2(4)-4 The volume of weathertight steel pontoon covers on hatchway coamings should be included in the calculations of the total volume (V) of the ship. If such covers are open on the underside, their volume should also be included in V_c .
- R.2(4)-5 Multipurpose ships which have the facility to trade with cargo hatches open or closed should always be measured with the hatch covers considered to be closed.
- R.2(4)-6 Masts, kingposts, cranes, crane and container support structures, which are completely inaccessible and above the upper deck, separated on all their sides from other enclosed spaces should not be included in the total volume of all enclosed spaces. Air trunks having a cross-sectional area not exceeding 1 m^2 may also be excluded under the before-mentioned conditions.

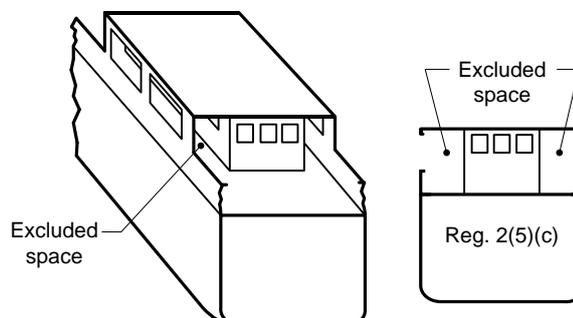
- R.2(4)-7 If enclosed spaces comply with the conditions for exclusion specified in regulation 2(5), then they should be excluded from the total volume of all enclosed spaces (V). Such spaces should be treated as "enclosed but excluded spaces" to differentiate from "enclosed and included spaces" (those "enclosed spaces" which do not comply with the conditions for exclusion specified in regulation 2(5)).
- R.2(4)-8 Open gratings that are part of the ship's hull, or of any deck, covering, partition or bulkhead, are not considered to bound enclosed space, and are ignored when applying this regulation.



- R.2(4)-9 Machinery such as mooring and towing equipment, winches, revolving cranes, cranes with truss structures, and other similar items should not be included in the total volume of all enclosed spaces (V).
- R.2(4)-10 Mobile cranes should not be included in the total volume of all enclosed spaces (V). "Mobile" means that the main structure (support) of the crane moves either longitudinally or transversely relative to the ship.

Reg. 2(5) Excluded spaces

- R.2(5)-1 The space between the side longitudinal bulkhead of a deckhouse and the bulwark below a deck extending from side to side supported by stanchions or vertical plates connected to the bulwarks, should be treated as an excluded space in accordance with regulation 2(5)(b) and (c). Similarly, open spaces directly below a bridge wing structure should not be treated as enclosed spaces.



- R.2(5)-2 In the case of a ro-ro ship, for example, where the space at the end of an erection is fitted with means for securing cargo, the space should be included in V in accordance with the first condition of regulation 2(5).

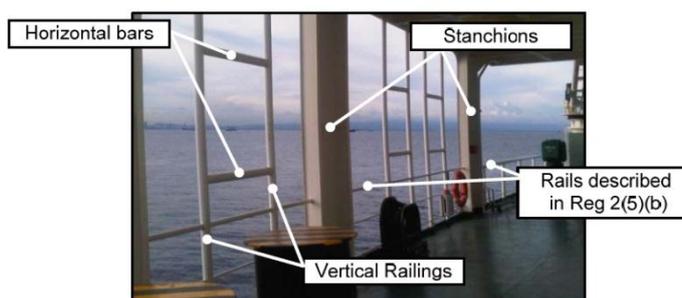
R.2(5)-3 In applying this regulation:

- .1 spaces excluded from the total volume of all enclosed spaces (V) are those spaces which are treated as enclosed ones under regulation 2(4) but also comply with the conditions for exclusion under regulation 2(5);
- .2 the volume of those enclosed spaces referred to in regulation 2(5)(a) to (e) shall be excluded from the total volume of all enclosed spaces (V), unless at least one of the following three conditions takes place:
 - the space is fitted with any means for securing cargo or stores;
 - the openings are fitted with any means of closure;
 - the construction provides any possibility of such openings being closed.

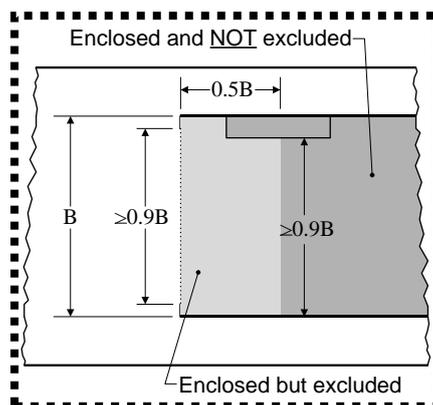
R.2(5)-4 In Appendix 1 to the Convention, labeling in the figures shall be interpreted as follows:

- .1 "O = excluded space" refers to an enclosed space or part of an enclosed space which corresponds to one of the situations described in regulation 2(5)(a) to (e) and which satisfies the conditions for exclusion from the total volume of all enclosed spaces (V) specified in this regulation;
- .2 "C = enclosed space" refers to an enclosed space or part of an enclosed space which does not correspond to any of the situations described in regulation 2(5)(a) to (e) and consequently can never be excluded from the total volume of all enclosed spaces (V);
- .3 "I = space to be considered as an enclosed space" refers to an enclosed space or part of an enclosed space which corresponds to one of the situations described in regulation 2(5)(a) to (e) but does not satisfy the conditions for exclusion from the total volume of all enclosed spaces (V) specified in this regulation.

R.2(5)-5 In applying regulation 2(5)(b) and (c), stanchions necessary to support an overhead deck and vertical railings are not considered to close or reduce the size of a side opening. Horizontal bars connecting vertical railings should not be treated as rails as described in regulation 2(5)(b).



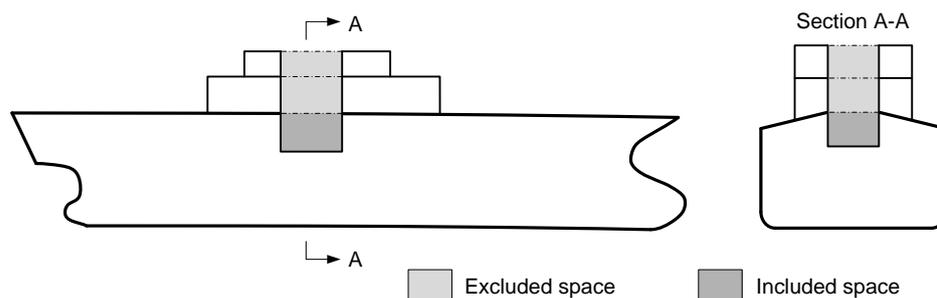
- R.2(5)-6 When applying the provisions of regulation 2(5), the phrase "breadth of the deck" means the breadth of the deckhouse structure at the line of the opening of the space, regardless of whether or not the structure extends from side to side. In addition to erections extending from side to side, the requirements for excluded spaces under regulation 2(5) are also applicable to structures that do not extend from side to side of the ship. In such structures B means breadth of a structure that does not extend from side to side, measured in way of the opening (see appendix 1 to the Convention).



- R.2(5)-7 Grates covering side or end openings should not be considered as means of closure when applying this regulation.

Reg. 2(5)(d) Space immediately below an uncovered opening

- R.2(5)(d)-1 The term "immediately below" means extending from the deck in which the opening occurs to the lower boundary of the opening being considered. Openings which penetrate the upper deck (as defined in regulation 2(1)) are only excluded to the line of the upper deck.



Reg. 2(6) Passenger

- R.2(6)-1 N_1 and N_2 should be obtained from the Administration's maritime safety authority.

Reg. 2(7) Cargo spaces

- R.2(7)-1 The volumes of the segregated ballast tanks should not be included in V_c provided they are not to be used for cargo.

- R.2(7)-2 The volumes of clean ballast tanks in oil tankers should be included in V_c when the ship is fitted with a crude oil washing system which would permit dual purpose cargo/clean ballast tank use of these tanks.
- R.2(7)-3 The volumes of dedicated clean ballast tanks should not be included in V_c provided that:
- .1 the tanks are not used for cargo;
 - .2 the ship carries a single IOPP Certificate which indicates it is operating with dedicated clean ballast tanks in accordance with regulation 13A, Annex I, MARPOL 73/78;
 - .3 the following notation is inserted in the REMARKS column on the International Tonnage Certificate (1969): "This ship carries an IOPP Certificate in conformity with regulation 13A, Annex I, MARPOL. The following tanks are dedicated solely to the carriage of clean ballast water: _____."
- R.2(7)-4 The volumes of slop tanks for cargo residues should be included in V_c .
- R.2(7)-5 In fishing vessels, the volumes of fish processing spaces for fishmeal, liver oil and canning, tanks for re-cooling fish, wet fish bunkers, stores for salt, spices, oil and tare should be included in V_c . Fishing gear stores should not be included in V_c .
- R.2(7)-6 The volume of refrigerating machinery used for refrigerating cargoes and situated within the boundaries of the cargo spaces should be included in V_c .
- R.2(7)-7 The volumes of mail rooms, baggage compartments separate from passenger accommodation, and bonded stores for passengers should be included in V_c . The volume of provision rooms for crew or passengers and bonded stores for crew should not be included in V_c .
- R.2(7)-8 On combination carriers, where the owners request to have the dual purpose oil/ballast tanks converted to ballast tanks and excluded from V_c , the ballast tanks should be required to be permanently disconnected from the oil cargo system and not used for the carriage of cargo. The ship should then be remeasured in accordance with regulation 5(3). Any ballast tanks not to be included in V_c should be solely allocated to ballast, connected to an independent ballast system, and not used to carry cargo.
- R.2(7)-9 When determining the volumes of cargo spaces, no account should be taken of insulation, sparring or ceiling which is fitted within the boundaries of the space concerned. For ships which have permanent independent cargo tanks constructed within the ship, e.g. gas tankers, the volume to be included in V_c should be calculated to the structural boundary of such tanks, irrespective of insulation which may be fitted on the inside or outside of the tank boundary.
- R.2(7)-10 The volumes of dual purpose spaces such as those used for both ballast and cargo should be included in V_c .
- R.2(7)-11 Spaces allocated to passenger automobiles should be included in V_c .

Reg. 3 Gross tonnage

- R.3-1 The K_1 coefficient used in the gross tonnage calculation may be derived from either the table in appendix 2 of the Convention or from the formula in regulation 3 at the discretion of the Administration.
- R.3-2 The final tonnage figure determined in accordance with regulation 3 and stated in the tonnage certificate should be given in rounded down figures without decimals.

Reg. 4 Net tonnage

- R.4-1 The K_2 coefficient used in the net tonnage calculation may be derived from either the table in appendix 2 of the Convention or from the formula in regulation 4 at the discretion of the Administration.
- R.4-2 The final tonnage figure determined in accordance with regulation 4 and stated in the tonnage certificate should be given in rounded down figures without decimals.

Reg. 6 Calculation of volumes

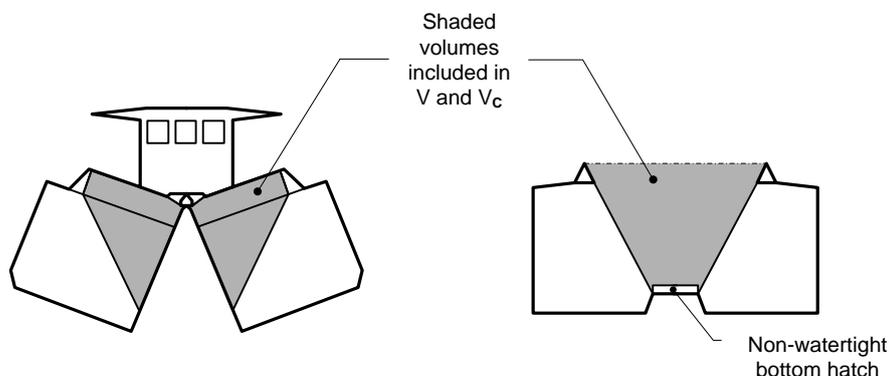
- R.6-1 Enclosed spaces above the upper deck, appendages and spaces open to the sea not exceeding 1 m^3 should not be measured.

Reg. 6(2) Appendages

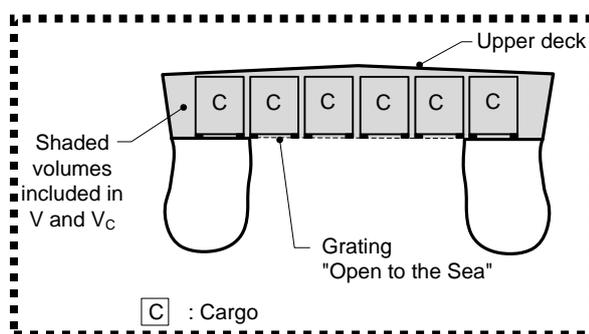
- R.6(2)-1 Bulbs, fairwaters, propeller shaft bossings or other structures should be treated as appendages.

Reg. 6(3) Spaces open to the sea

- R.6(3)-1 Hawse pipes, sea-valve recesses, thruster tunnels, stern chutes in fishing vessels, dredging wells in dredgers and other similar spaces fitted in the ship's hull should be dealt with as spaces open to the sea.
- R.6(3)-2 Volumes within the hulls of ships, such as split-hull barges and dredgers, should be retained in V and V_c notwithstanding that the space within the hull is temporarily opened to the sea when discharging cargo.



- R.6(3)-3 Spaces open to the sea should not be excluded from the total volume of all enclosed spaces (V) if they are used for cargo and/or buoyancy purposes.



Reg. 7 Measurement and calculation

- R.7-1 When a tonnage certificate and a copy of the calculations of the tonnages are transmitted to another Government in accordance with article 8(2) or 10(3) of the Convention, they should be accompanied by a form as shown in the annex, showing the main particulars of the tonnage calculations for easy reference. When listing underdeck volumes, the volumes may be combined (e.g. underdeck/extended forecastle, etc.) on the form.

Reg. 7(2) Calculation methods and accuracy

- R.7(2)-1 Administrations should decide on the degree of accuracy required for the tonnage calculations.

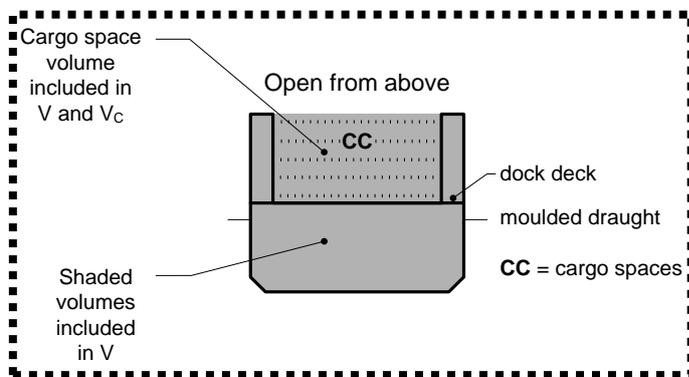
Novel Craft Interpretations (regulation 1(3))

NvICr. 1 Livestock carriers

- N.1-1 Livestock carriers are most often converted ships. Above the existing upper deck, one or more decks are constructed. Between these decks, the livestock corrals and their associated spaces are arranged, separated by, for example, railings, fences or gangways. The corrals are open to the air.
- N.1-2 Stanchions, fences and railings to keep livestock in the corrals are "other means for securing cargo" according to regulation 2(5).
- N.1-3 In applying the provisions of the 1969 Tonnage Convention, livestock structures should be included in the gross tonnage.

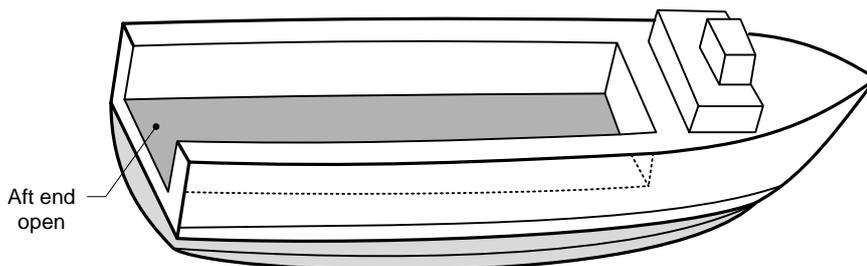
NvICr. 2 Dockships

N.2-1 A dockship may include in its main structural characteristics the absence of hatch covers above the cargo space but may have a dock deck above the moulded draught together with side erections.

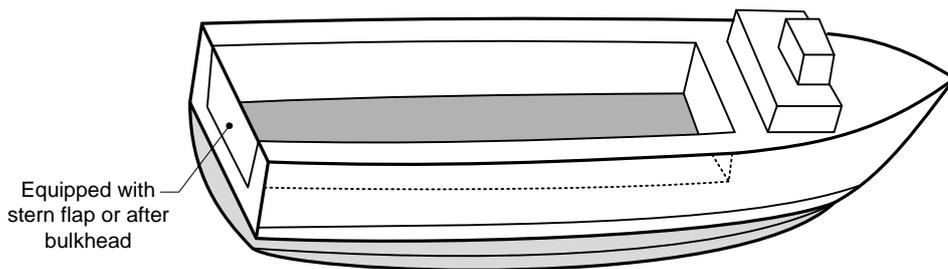


N.2-2 The dockships considered are described as:

.1 a dockship open-ended at the stern,



.2 a dockship fitted with a stern door or a grill stern door (see figure 8 in appendix 1).



N.2-3 The space above the dock deck, bounded on at least three sides by erections and intended for the carriage of cargo should be included.

N.2-4 In this context, an erection is defined as being an enclosed space bounded by bulkheads and a deck above.

NvICr. 3 Open-top containerships

N.3-1 Refer to resolution MSC.234(82) for *Recommendations concerning tonnage measurement of open-top containerships*.

Annex

FORM GIVING PARTICULARS OF UNIFORM TONNAGE CALCULATION

GROSS TONNAGE

Item No.	Name of Space	Location	Length	Moulded volume
	Underdeck Poop Bridge Forecastle Deckhouses Hatches, etc.			
		Total volume		

NET TONNAGE

	No. 1 hold No. 2 hold, etc. No. 1 tween decks, etc. No. 2 tween decks, etc. Hatches, etc.			
		Total volume		

ANNEX 5

DRAFT AMENDMENTS TO THE 2011 ESP CODE

**ANNEX TO THE INTERNATIONAL CODE ON THE ENHANCED PROGRAMME OF
INSPECTIONS DURING SURVEYS OF BULK CARRIERS AND OIL TANKERS,
2011 (2011 ESP CODE)**

ANNEX A

**CODE ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF
BULK CARRIERS**

Part A

**CODE ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF
BULK CARRIERS HAVING SINGLE-SIDE SKIN CONSTRUCTION**

- 1 The text in paragraph 5.3.2.3 is replaced by the following:
 - "3 hydraulic arm vehicles such as conventional cherry pickers, lifts and moveable platforms;"
- 2 The following new paragraph 5.5 is added after the existing paragraph 5.4:

"5.5 Rescue and emergency response equipment

If breathing apparatus and/or other equipment is used as "Rescue and emergency response equipment" then the equipment should be suitable for the configuration of the space being surveyed."
- 3 The existing paragraphs 5.5 and 5.6 are renumbered, respectively.
- 4 The following new paragraph 6.1.3 is added after the existing paragraph 6.1.2:

"6.1.3 For bulk carriers subject to SOLAS regulation II-1/3-10, the owner should arrange the updating of the Ship Construction File (SCF) throughout the ship's life whenever a modification of the documentation included in the SCF has taken place. Documented procedures for updating the SCF should be included within the Safety Management System."
- 5 The existing text under paragraph 6.3 is numbered as paragraph 6.3.1 and the following new paragraph 6.3.2 is added at the end of paragraph 6.3:

"6.3.2 For bulk carriers subject to SOLAS regulation II-1/3-10, the Ship Construction File (SCF), limited to the items to be retained on board, should be available on board."

6 The existing text under paragraph 6.4 is numbered as paragraph 6.4.1 and the following new paragraphs 6.4.2 and 6.4.3 are added at the end of paragraph 6.4:

"6.4.2 For bulk carriers subject to SOLAS regulation II-1/3-10, on completion of the survey, the surveyor should verify that the update of the Ship Construction File (SCF) has been done whenever a modification of the documentation included in the SCF has taken place.

6.4.3 For bulk carriers subject to SOLAS regulation II-1/3-10, on completion of the survey, the surveyor should verify any addition and/or renewal of materials used for the construction of the hull structure are documented within the Ship Construction File list of materials."

Part B

CODE ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF BULK CARRIERS HAVING DOUBLE-SIDE SKIN CONSTRUCTION

7 The text in paragraph 5.3.2.3 is replaced by the following:

"3 hydraulic arm vehicles such as conventional cherry pickers, lifts and moveable platforms;"

8 The following new paragraph 5.5 is added after the existing paragraph 5.4:

"5.5 Rescue and emergency response equipment

If breathing apparatus and/or other equipment is used as "Rescue and emergency response equipment" then the equipment should be suitable for the configuration of the space being surveyed."

9 The existing paragraphs 5.5 and 5.6 are renumbered, respectively.

10 The following new paragraph 6.1.3 is added after the existing paragraph 6.1.2:

"6.1.3 For bulk carriers subject to SOLAS regulation II-1/3-10, the Owner should arrange the updating of the Ship Construction File (SCF) throughout the ship's life whenever a modification of the documentation included in the SCF has taken place. Documented procedures for updating the SCF should be included within the Safety Management System."

11 The existing text under paragraph 6.3 is numbered as paragraph 6.3.1 and the following new paragraph 6.3.2 is added at the end of paragraph 6.3:

"6.3.2 For bulk carriers subject to SOLAS regulation II-1/3-10, the Ship Construction File (SCF), limited to the items to be retained on board, should be available on board."

12 The existing text under paragraph 6.4 is numbered as paragraph 6.4.1 and the following new paragraphs 6.4.2 and 6.4.3 are added at the end of paragraph 6.4:

"6.4.2 For bulk carriers subject to SOLAS regulation II-1/3-10, on completion of the survey, the surveyor should verify that the update of the Ship Construction File (SCF) has been done whenever a modification of the documentation included in the SCF has taken place.

6.4.3 For bulk carriers subject to SOLAS regulation II-1/3-10, on completion of the survey, the surveyor should verify any addition and/or renewal of materials used for the construction of the hull structure are documented within the Ship Construction File list of materials."

ANNEX B

CODE ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF OIL TANKERS

Part A

CODE ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF DOUBLE-HULL OIL TANKERS

- 13 The text in paragraph 5.3.2.3 is replaced by the following:
- "3 hydraulic arm vehicles such as conventional cherry pickers, lifts and moveable platforms;"
- 14 The following new paragraph 5.5 is added after the existing paragraph 5.4:
- "5.5 Rescue and emergency response equipment
- If breathing apparatus and/or other equipment is used as "Rescue and emergency response equipment" then the equipment should be suitable for the configuration of the space being surveyed."
- 15 The existing paragraphs 5.5 and 5.6 are renumbered, respectively.
- 16 The following new paragraph 6.1.3 is added after the existing paragraph 6.1.2:
- "6.1.3 For oil tankers subject to SOLAS regulation II-1/3-10, the Owner should arrange the updating of the Ship Construction File (SCF) throughout the ship's life whenever a modification of the documentation included in the SCF has taken place. Documented procedures for updating the SCF should be included within the Safety Management System."
- 17 The existing text under paragraph 6.3 is numbered as paragraph 6.3.1 and the following new paragraph 6.3.2 is added at the end of paragraph 6.3:
- "6.3.2 For oil tankers subject to SOLAS regulation II-1/3-10, the Ship Construction File (SCF), limited to the items to be retained on board, should be available on board."
- 18 The existing text under paragraph 6.4 is numbered as paragraph 6.4.1 and the following new paragraphs 6.4.2 and 6.4.3 are added at the end of paragraph 6.4:
- "6.4.2 For oil tankers subject to SOLAS regulation II-1/3-10, on completion of the survey, the surveyor should verify that the update of the Ship Construction File (SCF) has been done whenever a modification of the documentation included in the SCF has taken place.

6.4.3 For oil tankers subject to SOLAS regulation II-1/3-10, on completion of the survey, the surveyor should verify any addition and/or renewal of materials used for the construction of the hull structure are documented within the Ship Construction File list of materials."

Part B

CODE ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF OIL TANKERS OTHER THAN DOUBLE-HULL OIL TANKERS

- 19 The text in paragraph 5.3.2.3 is replaced by the following:
- "3 hydraulic arm vehicles such as conventional cherry pickers, lifts and moveable platforms;"
- 20 The following new paragraph 5.5 is added after the existing paragraph 5.4:
- "5.5 Rescue and emergency response equipment
- If breathing apparatus and/or other equipment is used as "Rescue and emergency response equipment" then the equipment should be suitable for the configuration of the space being surveyed."
- 21 The existing paragraphs 5.5 and 5.6 are renumbered, respectively.

ANNEX 6

DRAFT MSC CIRCULAR

UNIFIED INTERPRETATION RELATING TO THE APPLICATION OF THE PERFORMANCE STANDARD FOR ALTERNATIVE MEANS OF CORROSION PROTECTION FOR CARGO OIL TANKS OF CRUDE OIL TANKERS (RESOLUTION MSC.289(87))

1 The Maritime Safety Committee, at its [ninety-third session (14 to 23 May 2014)], with a view to providing specific guidance on the application of the relevant requirements of the *Performance standard for alternative means of corrosion protection for cargo oil tanks of crude oil tankers*, as adopted by resolution MSC.289(87), approved the Unified interpretation on the application of the *Performance standard for alternative means of corrosion protection for cargo oil tanks of crude oil tankers* (resolution MSC.289(87), prepared by the Sub-Committee on Ship Design and Construction, at its first session (20 to 24 January 2014).

2 Member Governments are invited to use the annexed unified interpretations as guidance when applying relevant provisions of the *Performance standard for alternative means of corrosion protection for cargo oil tanks of crude oil tankers* and to bring them to the attention of all parties concerned.

ANNEX

UNIFIED INTERPRETATION RELATING TO THE APPLICATION OF THE PERFORMANCE STANDARD FOR ALTERNATIVE MEANS OF CORROSION PROTECTION FOR CARGO OIL TANKS OF CRUDE OIL TANKERS, AS SET OUT IN THE ANNEX TO THE ANNEX OF RESOLUTION MSC.289(87)

Paragraph 2.1 – General principles

1 Normal and higher strength *Corrosion Resistant Steels* as defined within this UI, is steel whose corrosion resistance performance in the bottom or top of the internal cargo oil tank is tested and approved to satisfy the requirements in this MSC.289 (87) in addition to other relevant requirements for ship material, structure strength and construction. It is not the intention of this document to suggest that Corrosion Resistant Steels be used for corrosion resistant applications in other areas of a vessel.

2 *Corrosion Resistant Steels* are similar to conventional ship construction steels in terms of chemical composition and mechanical properties.

3 The weldability of *Corrosion Resistant Steels* is similar to the weldability of conventional ship construction steels and therefore normal shipyard welding requirements in terms of qualification by the approval of welding consumables and welding procedure qualification also apply.

Paragraph 2.2 – Technical File

1 The shipbuilder is to prepare and submit the Technical File to the Administration for verification. If the applicable corrosion protection method varies for different locations, the information required for the Technical File is to include each location and corrosion protection method separately. Once verified, one copy of the Technical File is to be placed on board the ship. The following construction records are to be included in the Technical File:

1.1 The copy of the Type Approval Certificate.

1.2 Other technical data is to include:

- (a) Detail of the brand of welding consumables and welding process used.
- (b) Repair method. Only to be included when specially recommended by the manufacturer of corrosion resistant steel.

1.3 Application records

- (a) Areas of application/location of corrosion resistant steel.
- (b) Brand of corrosion resistant steel and thickness.

Note: Items (a) and (b) above may be substituted by the information given in the hull-related approved drawings. However, each brand of corrosion resistant steel used and its location is to be indicated on the approved drawings, the drawings are to be included in the Technical File.

1.4 The test certificates and actual measured values of plate thickness of each corrosion resistant steel, and individual welding conditions need not be included.

2 After the ship enters service, the shipowner or operator is to maintain repair data in the Technical File for review by the Administration. The information required is to include each location and corrosion protection method separately. These records should include:

2.1 Where repairs are made in service to the cargo oil tank in which corrosion resistant steel is used, the following information is to be added to the Technical File.

- (a) Areas of repair work
- (b) Repair method (replacement by corrosion resistant steel or coating)
- (c) Records of the brand of corrosion resistant steel used, plate thickness and welding consumables (brand name and welding method) if corrosion resistant steel is used.
- (d) Records in accordance with Performance standard for protective coatings for cargo oil tanks of crude oil tankers (MSC.288(87)), if coating is used.

2.2 Repairs that require records to be maintained as mentioned in paragraph 2.1 above include the following:

- (a) Replacement by corrosion resistant steel
- (b) Application of coating on members in which corrosion resistant steel is used (including cases where corrosion resistant steel is replaced with conventional steel and coating).^(Note 1)
- (c) Repairs of pitted parts.^(Note 2)

Note 1: Details of coating on repairs to corrosion resistant steel are to be recorded in the Corrosion Resistant Steel Technical File. In such cases, duplicates of these coating records do not need to be included in the Coating Technical File.

Note 2: The wastage limit of the pitted part or area is to be as deemed appropriate by the Classification Society and/or Administration. However, the standard value of the permissible wastage amount is to be taken as about 40% of the original thickness. In this case weld repairs are required. Only welding consumables approved for the relevant corrosion resistant steel are to be used. The full depth of the pitting is to be filled up by the weld metal. If non-approved welding consumables are used, an appropriate area around the repaired part is to be coated suitably after the repairs in accordance with the IMO Performance standard for protective coatings for cargo oil tanks of crude oil tankers.

2.3 Plate thickness records during periodical surveys need not be recorded in the Technical File.

Paragraph 3.3 – Special application

1 Where other items of structure, such as appurtenances, are not clearly identified, the application of the PSPC-**COT Alt** to these items is described here.

1.1 Means of access, to be used for ship inspections, which are not integral to the ship structure.

1.1.1 Permanent means of access which are not integral to the ship's structure include:

- Ladders
- Rails
- Independent platforms
- Steps

1.1.2 Appropriate corrosion protection measures are to be adopted for permanent means of access mentioned in paragraph 1.1.1 above.

1.1.3 When corrosion resistant steel is used, in principle, a corrosion resistant steel of the same brand as used in the main structure is to be used for the means of access and the attachments.

1.1.4 When conventional steel is used, and is welded to corrosion resistant steel, corrosion protection measures for the attachment and weld are recommended to be in accordance with *Performance standard for protective coatings for cargo oil tanks of crude oil tankers* (MSC.288 (87)).

1.1.5 Other corrosion protection measures are to be left to the discretion of the Administration.

1.1.6 Where other corrosion protection measures other than those stated above, for example cathodic protection are used, the performance of the corrosion resistant steel of the surrounding structure is not to be impaired.

1.2 Access arrangements integral to the ship's structure

1.2.1 The phrase "Access arrangements that are integral to the ship structure" in paragraph 3.2.2 of the annex to Performance standard for alternative means of corrosion protection for cargo oil tanks (MSC.291(87)) means access arrangements integral to the ship structure such as the items mentioned below, for access in the cargo oil tanks of crude oil tankers.

- Stiffeners and girders with increased depth for walkways

1.2.2 Appropriate corrosion protection measures are to be adopted for access arrangement given in paragraph 1.2.1. If coating is applied, the provisions of Performance standard for protective coatings for cargo oil tanks (MSC.288(87)) are to be followed. If corrosion resistant steel is used on the above arrangements, in principle, corrosion resistant steel of the same brand/type as that used in the cargo oil tanks of crude oil tankers, is to be used.

1.3 Supporting members, etc.

1.3.1 It is recommended that pipes and supporting members for measuring equipment or outfitting items that are not strength members of the hull be protected either by coating or by use of corrosion resistant steel in accordance with the provisions of paragraph 1.1.4.

1.4 Work attachments

1.4.1 In the case of attachments (conventional steel) used only during construction work such as hanging pieces, if welding consumables which are not indicated on the Type

Approval Certificate of the corrosion resistant steel are used, it is recommended that the welded part is coated in accordance with figure 3.3.1.

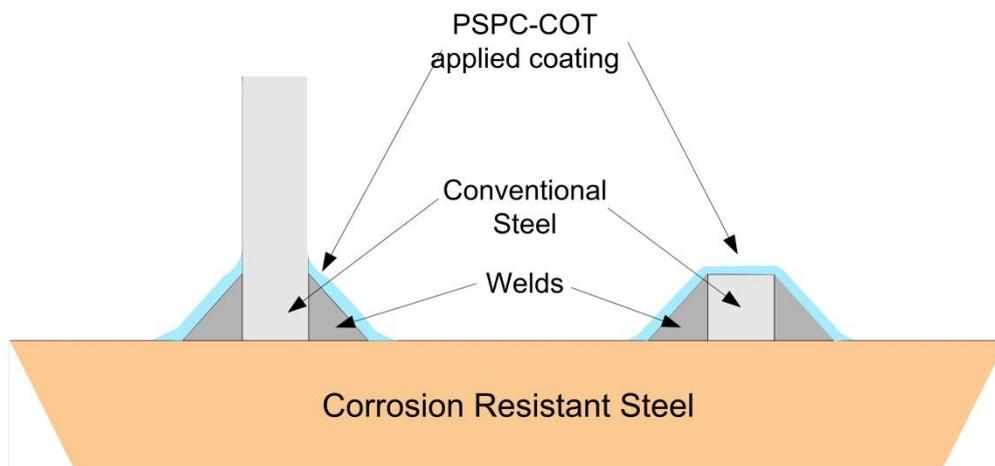


Fig. 3.3.1 Range of coating when work attachments are welded to corrosion resistant steel

Paragraph 3.2 – Area of application

- 1 Structural members in the COT that require protection measures against corrosion are specified in the Performance standard for alternative means of corrosion protection for cargo oil tanks of crude oil tankers (resolution MSC.289(87)).
- 2 Different methods of corrosion protection (coating and corrosion resistant steel) may be adopted for (a) and (b) above. Moreover, a combination of different corrosion protection methods may be used for each of the structural members within the areas identified by (a) and (b).
- 3 Acceptable combinations of corrosion protection methods are shown in table 1.

Table 1 - Acceptable combinations of corrosion protection methods

Member		Lower surface of strength deck (a)	Upper surface of inner bottom plating (b)
Corrosion protection method	Case 1	Corrosion resistant steel – Brand A*	Corrosion resistant steel – Brand B*
	Case 2	Coating	Corrosion resistant steel – Brand B*
	Case 3	Corrosion resistant steel – Brand A*	Coating
	Case 4	Corrosion resistant steel – Brand C*	Corrosion resistant steel – Brand C*

*Corrosion Resistant Steel and coating may be used on the same member.

- 4 If different corrosion protection methods (coating and corrosion resistant steel) are selected for either (a) or (b), the selected procedure for each member is to comply with the relevant performance standards.
- 5 Where corrosion resistant steel is used it is to be type approved by the Administration.

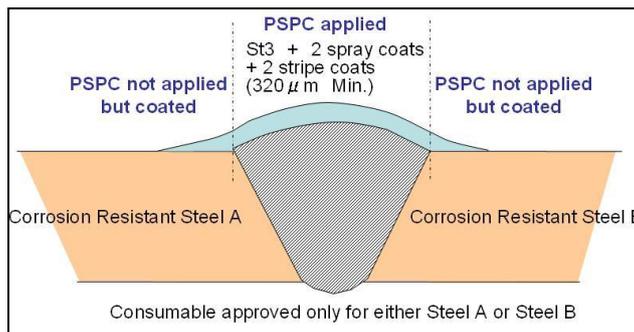


Figure 3.4.1

6 Where different brands of corrosion resistant steels are used in the same structural member, see figure 3.4.1, the weld joining the two different steels is to be coated. Coating is to be in accordance with *Performance standard for protective coatings for cargo oil tanks of crude oil tankers* (MSC.288(87)). However, coating of the weld is not required if the welding consumable used to produce the weld has been subject to the necessary corrosion tests. In such a case, a type approval certificate is required for the both steel brands in association with the welding consumable used.

7 When corrosion resistant steel and conventional steel are used together in an area where corrosion protection is necessary, see figure 3.4.2., the conventional steel and the weld is to be coated in accordance with *Performance standard for protective coatings for cargo oil tanks of crude oil tankers* (MSC.288(87)),

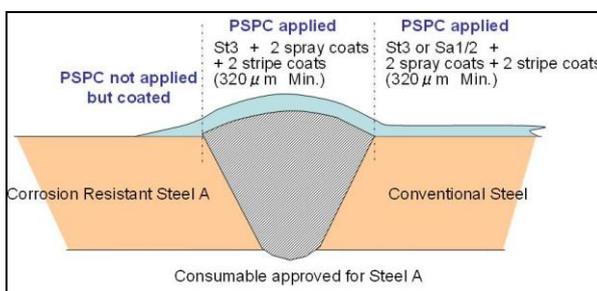


Figure 3.4.2

8 Where the welding consumable used is different from that indicated on the Type Approval Certificate of corrosion resistant steel, the weld is to be coated in accordance with *Performance standard for protective coatings for cargo oil tanks of crude oil tankers* (MSC.288(87)), see figure 3.4.3.

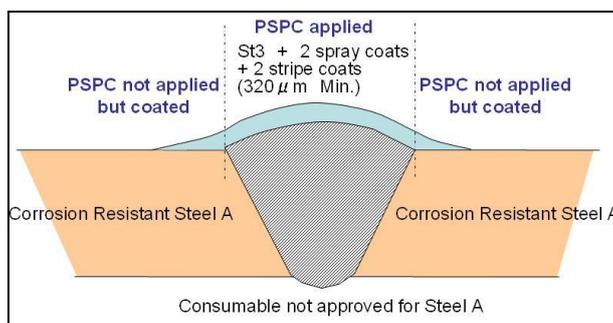


Figure 3.4.3

Paragraph 4 – Approval

1 Approval procedure

1.1 The steel must be approved and graded accordingly.

1.2 The approval procedure for corrosion testing of corrosion resistant steel is described in the annex to *Performance standard for alternative means of corrosion protection for cargo oil tanks of crude oil tankers* (MSC.289(87)).

1.3 The Administration's approval is not needed for the testing laboratory where a surveyor of the Administration is present at specified stages to witness the approval tests.

1.4 In the case where the Administration is not present at specified stages to witness the approval tests, the testing laboratory is to be approved.

1.5 Where the scope of approval changes, for example for additions to the applicable welding consumables, the effects of these changes are to be subjected to corrosion resistance tests for the welded joints specified in the annex to *Performance standard for alternative means of corrosion protection for cargo oil tanks of crude oil tankers* (MSC.289(87)).

2 Type Approval Certificate

2.1 The Type Approval Certificate for approved corrosion resistant steel is to include the following items:

- (a) Brand name, manufacturer and certificate number
- (b) Steel grade and area of application designation
- (c) Chemical composition range (including additive and/or controlling element percentages to improve corrosion resistance)
- (d) Maximum thickness
- (e) Steelmaking process
- (f) Casting process
- (g) Delivery condition
- (h) Brand of welding consumables and welding method
- (i) Period of validity of approval

2.2 The Type Approval Certificate is valid for a maximum period of 5 years from the date of approval. When the renewal of approval is carried out, the period of validity will be a maximum period of 5 years from the next day after the expiry date of the previous validity.

Paragraph 5 – Inspection and verification requirements

1 General requirements

1.1 The general requirements are as follows:

- (a) Corrosion resistant steel type approved by the Administration is to be used.
- (b) Welding consumables used are to be the Brand specified on the type approval certificate.
- (c) Welding work is to be implemented according to the approved welding procedure.
- (d) The correct use of corrosion resistant steel is verified by engineering review and survey.
- (e) The shipbuilder is to prepare a Technical File after the construction work has been completed, and submit it to the Administration for verification.
- (f) The Technical File is to be maintained on board the ship.

1.2 If any of the items in 1.1(a) to 1.1(f) above are not complied with, the Administration notifies the shipbuilder immediately who confirms the corrective action to be followed and its completion. A SOLAS Safety Construction Certificate shall not be issued until all required corrective actions have been closed to the satisfaction of the Administration.

2 Procedure applicable to new ships

2.1. Product inspection is to be carried out as part of material certification. The control range of the chemical composition is determined as follows:

2.1.1 The manufacturer is to supply data relating to the control of applicable chemical elements that the manufacturer has intentionally added or is controlling to improve corrosion resistance. Upper and lower limits for all such elements and any relationship between these elements are to be disclosed. The manufacturer is to obtain the Administration's approval for these additions and the relationships.

2.1.2 The effect of variation of each element is to be assessed by using sufficient corrosion tests to determine the effects of variation with variations of other elements used to enhance corrosion resistance.

2.1.3 The corrosion resistance test is to be conducted in accordance with appendix of annex 3 to *Performance standard for the alternative means of corrosion protection for cargo oil tanks of crude oil tankers* (MSC.289(87)).

2.2 Survey during the construction stage

2.2.1 The Administration's surveyor is to verify that corrosion resistant steel has been used correctly at the appropriate locations.

2.2.2 The verification in 2.2.1 is to be implemented periodically, and the frequency is to be determined on assessment of quality control feedback of each shipyard. However, if some deficiency is found, the shipyard is to formulate the necessary remedial action with regard to both the deficient location and counter measures to be taken to improve inspection methods.

3 Procedure applicable to ships in service

3.1 If the repair method is described in the Technical File, repairs are to be carried out in accordance with the said method.

3.2 If corrosion resistant steel or coated member is to be replaced, the same corrosion protection method to the one used during construction is recommended.

3.3 If corrosion resistant steel is to be used during repairs, use of the corrosion resistant steel of the same brand as that used during construction is recommended.

3.4 If conventional steel is used in a corrosion resistant steel member that is to be replaced, coating is to be applied to the conventional steel. In this case, it is required that the coating complies with 3.4.3 of the *Performance standard for protective coatings for crude oil tanks of crude oil tankers* (MSC.288(87)), see figure 3.4.2.

3.5 The application of welding consumables to be used is to be confirmed through the latest Type Approval Certificate of the relevant corrosion resistant steel to ensure conformity (brands of the welding consumables are indicated on the Type Approval Certificate).

3.6 If the welding consumables specified in the Type Approval Certificate for the corrosion resistant steel cannot be used, the weld is to be coated, see figure 3.4.3. In this case, it is required that the coating complies with 3.4.3 of the *Performance standard for protective coatings for cargo oil tanks of crude oil tankers* (MSC.288(87)).

4 Welding Considerations

4.1 Welding workmanship standards accepted for conventional steel may be used.

4.2 An approved welding procedure is to be used for welding work as appropriate to the grades (excluding subscripts related to corrosion resistance), welding consumables, welding position and plate thickness, etc. of the corrosion resistant steel to be used.

Appendix – Test Procedures for Qualification of Corrosion Resistant Steel for Cargo Tanks in Crude Oil Tankers

1 Test on simulated upper deck conditions

1.1 Test condition

(a) The chemical composition of the conventional shipbuilding steel used for test purposes (table 1 in the annex to the *Performance standard for alternative means of corrosion protection for cargo oil tanks of crude oil tankers* (MSC.289 (87))) is to be based on ladle analysis given in the mill certificate. Steel complying with a national standard that meets the requirements of table 1 is also acceptable.

(b) All the base material specimens should be located in one tank. Figure 2 in the annex to the *Performance Standard for alternative means of corrosion protection for cargo oil tanks of crude oil tankers* (MSC.289(87)) only shows locations of 20 specimens. The tank can be designed to hold 25 or more specimens; alternatively specimens can be added and removed as necessary so that the appropriate time periods are achieved within the total timescale of 98 days.

- (c) Since certain factors such as control and measurement of temperature and size of chamber may affect the corrosion rate achieved, it should be confirmed that the corrosion rate of conventional steel in the conditions and equipment of the test, satisfies the rate criteria, before carrying out corrosion test for evaluation of corrosion resistant steel.
- (d) To remove specimens, the chamber is to be purged with 100% nitrogen gas while the specimens are in the high temperature region until the specimens are dry.
- (e) The cycling pattern of specimen temperature and temperature of distilled water should be controlled such that each cycle is as identical as possible throughout the whole corrosion test period. These temperatures must be recorded. See figure App 1

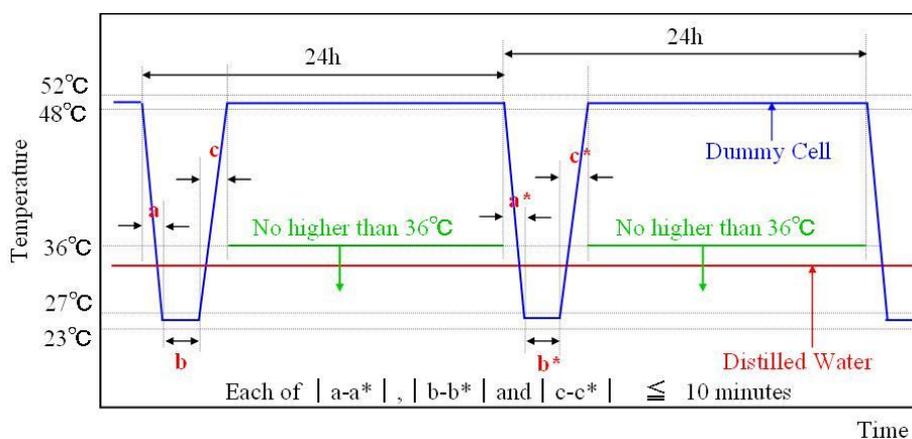


Figure App 1 – Schematic view of temperature controlling accuracy of specimens and distilled water during corrosion test

- (f) The transition time, a, a*, c and c* in figure App 1 is the time from when the cooling and heating commences until the lower or upper temperature is reached, see figure App 2. The transition of each cycle is to be as identical as possible throughout the whole corrosion test period.

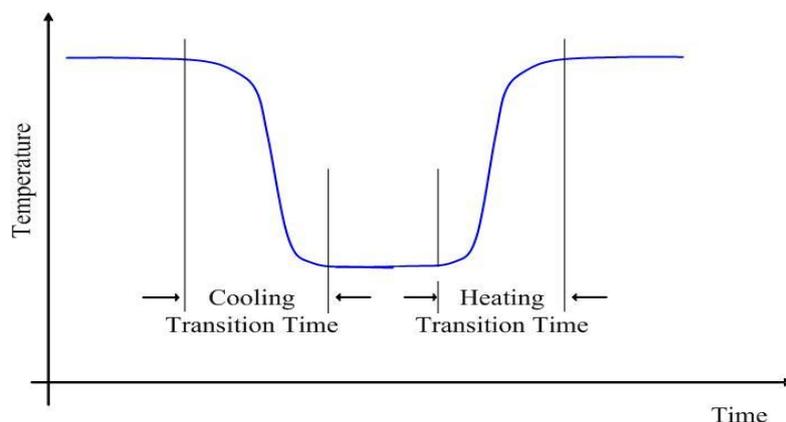


Figure App 2 – Transition time definition

- (g) The temperature of both the specimens and the water is to be continuously recorded throughout the test.

- (h) Welded specimens may be tested with the parent material tests or tested separately against 5 conventional steel specimens.
- (i) Base material is to be prepared such that the surface to be tested is to be taken from a position within 2 mm of one rolled surface. This surface is to be ground to bare steel and polished to 600 grit finish.
- (j) For welded samples, a test assembly is to be made from the same steel cast as the base material test in (i) but may be from a plate of different thickness. The assembly is to be welded using the process and consumable to be approved for use with the base material. The surface to be tested is to be selected such that the width of weld metal, excluding heat affected zone, is to be between 10 and 20 mm. This surface is to be ground to bare steel and polished to 600 grit finish.
- (k) Specimens are to be weighed to an accuracy of ± 1 mg.
- (l) Where the calculated corrosion loss of conventional steel is less than 0.05 mm/year, the concentration of H₂S may be increased in the simulated cargo oil tank gas. All tests will be carried out at this increased level.
- (m) At least 3 values of individual weight loss of conventional steel should be in the range of maximum X and minimum Y measured in grams.

$$X = (0.11 \times S \times D)/10$$

$$Y = (0.05 \times S \times D)/10$$

Where

S = surface area (cm²)

D = density (g/cm³)

2 Test on simulated inner bottom conditions

2.1 Test condition

- (a) The conventional steel used should also meet the requirements of table 1 in the annex to the *Performance standard for alternative means of corrosion protection for cargo oil tanks of crude oil tankers* (MSC.289(87)) and interpretations 1.1 (a) above.
- (b) Base material is to be prepared such that one surface is to be taken from a position within 2 mm of one rolled surface. All surfaces are to be ground to bare steel and polished to 600 grit finish.
- (c) For welded samples, a test assembly is to be made from the same steel cast as the base material test in (e) but may be from a plate of different thickness. The assembly is to be welded using the process and consumable to be approved for use with the base material. The surface to be tested is to be selected such that the width of weld metal, excluding heat affected zone, is to be between 10 and 20 mm. This surface is to be ground to bare steel and polished to 600 grit finish.
- (d) Specimens are to be weighed to an accuracy of ± 1 mg.

- (e) One specimen that has a corrosion rate deviating from the average corrosion rate by more than +25% may be eliminated from the results, provided that the cause of the accelerated corrosion is demonstrated to be due to localized corrosion around the hanging hole and/or stamp (e.g. crevice corrosion, pitting corrosion, etc.).

3 Interpretation of weld discontinuity

3.1 Preparation of samples after corrosion test

- (a) All five samples are to be prepared as follows.
- (b) Two full thickness specimens approximately 20 mm long x 5 mm wide are to be sectioned with their principle axis perpendicular to the weld fusion line. Each specimen is to be located such that the weld fusion line is located approximately at its mid length. See figure App 3.

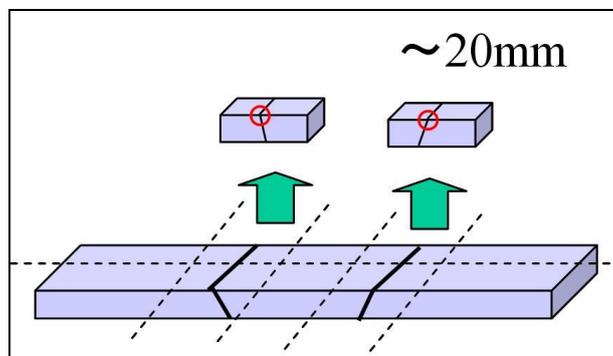


Figure App 3 – Sectioning plan

- (c) The specimens are to be mounted in resin to allow polishing of the cross section. The specimens are to be etched in Nital after polishing to reveal the fusion boundary.
- (d) A photomicrograph is to be taken at a magnification of approximately 100 X.

3.2 Evaluation of depth step

- (a) On the photomicrograph, construct a line **A–B**, perpendicular to the corrosion surface through the point where fusion line and the surface cross. See figure App 4.

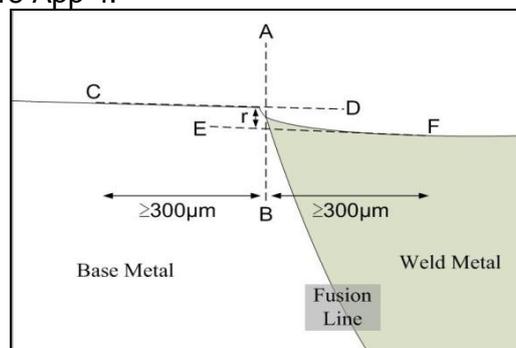


Figure App 4 – Determination of corrosion depth on photomicrograph

- (b) Construct two parallel lines **C-D** and **E-F** one representing the higher level, the other the lower level. Each line is to be constructed over a distance of $\geq 300 \mu\text{m}$ from line A-B on the base metal and weld metal side, respectively.
- (c) Measure the distance r mm between the intersection point at line A-B and each average surface line on the photomicrograph.
- (d) If the intersection point at line A-B and average surface line of welded metal part is above that of base metal part, then the existence of step should be neglected for this sample.
- (e) Calculate the depth of discontinuous step **R** in μm from the actual photomicrograph magnification M as follows:

$$R(\mu\text{m}) = \frac{r(\text{mm}) \times 1000}{M}$$

3.3 Evaluation of step angle

- (a) Evaluation for angle of step is unnecessary if the depth of step calculated on both samples see 3.2, are not greater than $30 \mu\text{m}$ or if either step exceeds $50 \mu\text{m}$ for a single specimen. Otherwise the angle of step is to be calculated as follows.
- (b) Produce a photomicrograph at a magnification of approximately 250 X, see figure App 5.
- (c) Draw an average surface line C-D for base metal part and E-F for weld metal part.
- (d) Find the closest intersection point with the step of the base metal surface profile and the constructed line C-D and the closest intersection point with the step for weld metal constructed line E-F respectively, and connect those two intersection points.

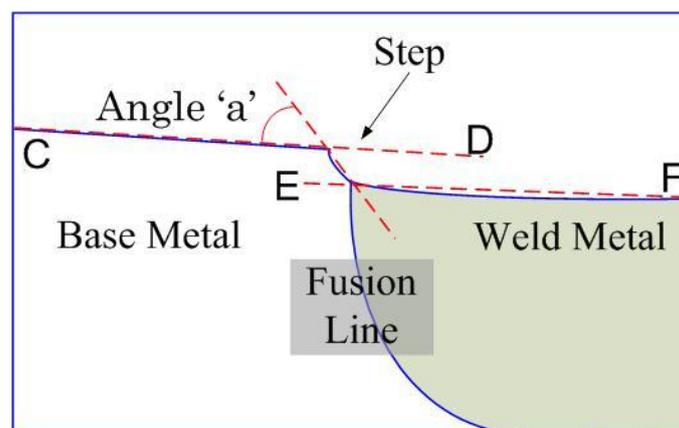


Figure App 5 – Calculation of step angle

- (e) Measure the angle "a" in degrees given by the line C-D and the connected line described in paragraph d, see figure App 2.

3.4 Acceptance criteria

- (a) If the depth of both steps are less than or equal to 30 μm then the measurement of angle is unnecessary, and the sample is considered to be acceptable.
- (b) If the depth of steps on both photomicrographs are less than or equal to 50 μm and in addition if both the measured angles are less than or equal to 15 degrees, then the sample is considered to be acceptable.
- (c) If either of the conditions described in paragraphs a or b above are not in compliance, the sample is considered to contain a "*discontinuous surface*" and fails the test.
- (d) Welds should be evaluated as "*without discontinuous surface*" when all 5 corrosion test samples are considered acceptable.

ANNEX 7

DRAFT MSC CIRCULAR

**UNIFIED INTERPRETATION RELATING TO THE APPLICATION OF THE
PERFORMANCE STANDARD FOR PROTECTIVE COATINGS FOR
CARGO OIL TANKS OF CRUDE OIL TANKERS
(RESOLUTION MSC.288(87))**

1 The Maritime Safety Committee, at its [ninety-third session (14 to 23 May 2014)], with a view to providing specific guidance on the application of the relevant requirements of the *Performance standard for protective coatings for cargo oil tanks of crude oil tankers*, as adopted by resolution MSC.288(87), approved the Unified interpretation on the application of the *Performance standard for protective coatings for cargo oil tanks of crude oil tankers* (resolution MSC.288(87), prepared by the Sub-Committee on Ship Design and Construction, at its first session (20 to 24 January 2014).

2 Member Governments are invited to use the annexed unified interpretations as guidance when applying relevant provisions of the *Performance standard for protective coatings for cargo oil tanks of crude oil tankers* and to bring them to the attention of all parties concerned.

ANNEX

UNIFIED INTERPRETATION RELATING TO THE APPLICATION OF THE PERFORMANCE STANDARD FOR PROTECTIVE COATINGS FOR CARGO OIL TANKS OF CRUDE OIL TANKERS (PSPC-COT), AS SET OUT IN THE ANNEX TO RESOLUTION MSC.288(87)

Paragraph 2 – Definitions

GOOD: Condition with spot rusting on less than 5% of the area under consideration without visible failure of the coating, or no-perforated blistering. Breakdown at edges or welds should be less than 20 % of edges or weld lines in the area under consideration.

Coating Technical File: A term used for the collection of documents describing issues related to the coating system and its application from the point in time when the first document is provided and for the entire life of the ship including the inspection agreement and all elements of PSPC-COT 3.4.

Paragraph 3.2 – General principles

1. Inspection of surface preparation and coating processes agreement shall be signed by shipyard, shipowner and coating manufacturer and shall be presented by the shipyard to the Administration for review prior to commencement of any coating work on any stage of a new building and as a minimum shall comply with the PSPC-COT.
2. To facilitate the review, the following from the CTF, shall be available:
 - a) Coating specification including selection of areas (spaces) to be coated, selection of coating system, surface preparation and coating process.
 - b) Statement of Compliance or Type Approval of the coating system.
3. The agreement shall be included in the CTF and shall at least cover:
 - a) Inspection process, including scope of inspection, who carries out the inspection, the qualifications of the coating inspector(s) and appointment of one qualified coating inspector (responsible for verifying that the coating is applied in accordance with the PSPC-COT). Where more than one coating inspector will be used then their areas of responsibility shall be identified. (For example, multiple construction sites).
 - b) Language to be used for documentation.
4. Any deviations in the procedure relative to the PSPC-COT noted during the review shall be raised with the shipyard, which is responsible for identifying and implementing the corrective actions.
5. Cargo Ship Safety Certificate or Cargo Ship Safety Construction Certificate, as appropriate, shall not be issued until all required corrective actions have been closed to the satisfaction of the Administration.

Paragraph 3.4 – Coating Technical File (CTF)

Procedure for Coating Technical File Review

1 The shipyard is responsible for compiling the Coating Technical File (CTF) either in paper or electronic format, or a combination of the two.

2 The CTF is to contain all the information required by the PSPC 3.4 and the inspection of surface preparation and the coating processes agreement (see PSPC-COT, paragraph 3.2).

3 The CTF shall be reviewed for content in accordance with the PSPC-COT, paragraph 3.4.2.

4 Any deviations found under 3 shall be raised with the shipyard, which is responsible for identifying and implementing the corrective actions.

5 Cargo Ship Safety Certificate or Cargo Ship Safety Construction Certificate, as appropriate, shall not be issued until all required corrective actions have been closed to the satisfaction of the Administration.

Paragraph 3.5 – Health and safety

In order to document compliance with PSPC-COT 3.5, relevant documentation from the coating manufacturer concerning health and safety aspects such as Material Safety Data Sheet is recommended to be included in the CTF for information.

Paragraph 4.5 – Special application

Reference is made to the non-mandatory MSC/Circ.1279 *Guidelines for corrosion protection of permanent means of access arrangements*, adopted by MSC 84 in May 2008.

Paragraph 4, table 1 – Footnotes of standards

Only the footnoted standards referred to in PSPC-COT table 1 are to be applied, i.e. they are mandatory.

Paragraph 4, table 1, section 1.3 – Design of coating system

Procedure for coating system approval

Type Approval Certificate showing compliance with the PSPC-COT 5 shall be issued if the results of either method A+C, or B+C are found satisfactory by the Administration.

The Type Approval Certificate shall indicate the Product and the Shop Primer tested. The certificate shall also indicate other type approved shop primers with which the product may be used which have under gone the cross over test in a laboratory meeting the requirements in Method A, 1.1 of this UI.

The documents required to be submitted are identified in the following sections, in addition for all type approvals the following documentation is required:

Technical Data Sheet showing all the information required by PSPC-COT 3.4.2.2.

Winter type epoxy is required separate prequalification test including shop primer compatibility test according to PSPC-COT, annex 1. Winter and summer type coating are considered different unless Infrared (IR) identification and Specific Gravity (SG) demonstrates that they are the same.

Method A: Laboratory test

1.1 Coating pre-qualification test shall be carried out by the test laboratory which is recognized by the Administration.

1.2 Results from satisfactory pre-qualification tests (PSPC-COT table 1: 1.3) of the coating system shall be documented and submitted to the Administration.

1.3.1 Type Approval tests shall be carried out for the epoxy based system with the stated shop primer in accordance with the PSPC-COT, annex 1. If the tests are satisfactory, a Type Approval Certificate will be issued to include both the epoxy and the shop primer. The Type Approval Certificate will allow the use of the epoxy either with the named shop primer or on bare prepared steel.

1.3.2 An epoxy based system may be used with shop primers other than the one with which it was originally tested provided that, the other shop primers are approved as part of a system, PSPC-COT table 1: 2.3 and table 1: 3.2, and have been tested according to the immersion test of PSPC-COT annex 1 or in accordance with resolution MSC.215(82), which is known as the "Crossover Test". If the test or tests are satisfactory, a Type Approval Certificate will be issued. In this instance the Type Approval Certificate will include the details of the epoxy and a list of all shop primers with which it has been tested that have passed these requirements. The Type Approval Certificate will allow the use of the epoxy with all the named shop primers or on bare prepared steel.

1.3.3 Alternatively the epoxy can be tested without shop primer on bare prepared steel to the requirements of the PSPC-COT, annex 1. If the test or tests are satisfactory, a Type Approval Certificate will be issued. The Type Approval Certificate will just record the epoxy. The certificate will allow the use of the epoxy on bare prepared steel only. If in addition, crossover tests are satisfactorily carried out with shop primers, which are approved as part of a system, the Type Approval Certificate will include the details of shop primers which have satisfactorily passed the crossover test. In this instance the Type Approval Certificate will allow the use of the epoxy based system with all the named shop primers or on bare prepared steel.

1.3.4 The Type Approval Certificate is invalid if the formulation of either the epoxy or the shop primer is changed. It is the responsibility of the coating manufacturer to inform the Administration immediately of any changes to the formulation.

1.3.5 For the coating pre-qualification test, the measured average dry film thickness (DFT) on each prepared test panels shall not exceed a nominal DFT (NDFT) of 320 microns plus 20% unless a paint manufacturer specifies a NDFT greater than 320 microns. In the latter case, the average DFT shall not exceed the specified NDFT plus 20% and the coating system shall be certified to the specified NDFT if the system passes the tests according to annex 1 of PSPC-COT. The measured DFT shall meet the "90/10" rule and the maximum DFT shall be always below the maximum DFT value specified by the manufacturer.

Method B: 5 years field exposure

1.4 Coating manufacturer's records, which shall at least include the information indicated in 1.4.1, shall be examined to confirm coating system has 5 years field exposure, and the current product is the same as that being assessed.

1.4.1 Manufacturer's records

- Original application records
- Original coating specification
- Original Technical Data Sheet
- Current formulation's unique identification (Code or number)
- If the mixing ratio of base and curing agent has changed, a statement from the coating manufacturer confirming that the composition mixed product is the same as the original composition. This shall be accompanied by an explanation of the modifications made.
- Current Technical Data Sheet for the current production site
- SG and IR identification of original product
- SG and IR identification of the current product
- If original SG and IR cannot be provided then a statement from the coating manufacturer confirming the readings for the current product are the same as those of the original.

1.5 Either class survey records from an Administration or a joint (coating manufacturer and Administration) survey of cargo tanks of a selected vessel is to be carried out for the purpose of verification of compliance with the requirements of 1.4 and 1.9. The reporting of the coating condition in both cases shall be in accordance with the principles given in section 4 of MSC.1/Circ.1399.

1.6 The selected vessel is to have cargo tanks in regular use, of which:

- At least one tank is exposed to minimum temperature of 60 degree C plus or minus 3 degree.
- For field exposure the ship should be trading in varied trade routes and carrying substantial varieties of crude oils including highest temperature and lowest pH limits to ensure a realistic sample: for example, three ships on three different trade areas with different varieties of crude cargoes.

1.7 In the case that the selected vessel does not meet the requirements in 1.6 then the limitations on lowest pH and Highest temperature of crude oils carried shall be clearly stated on the type approval certificate.

1.8 In all cases of approval by Method B, the shop primer shall be removed prior to application of the approved epoxy based system coating, unless it can be confirmed that the shop primer applied during construction, is identical in formulation to that applied in the selected vessel used as a basis of the approval.

1.9 All cargo tanks shall be in "GOOD" condition excluding mechanical damages, without touch up or repair in the prior 5 years.

1.9.1 "Good" is defined as: *Condition with spot rusting on less than 5% of the area under consideration without visible failure of the coating, or no perforated blistering. Breakdown at edges or welds should be less than 20% of edges or welds in the area under consideration.*

1.9.2 Examples of how to report coating conditions with respect to areas under consideration should be as those given in the principles given in section 4 of MSC.1/Circ.1399.

1.10 If the applied NDFT is greater than required by the PSPC, the applied NDFT will be the minimum to be applied during construction. This will be reported prominently on the Type Approval Certificate.

1.11 If the results of the inspection are satisfactory, a Type Approval Certificate shall be issued to include both the epoxy based system and the shop primer. The Type Approval Certificate shall allow the use of the epoxy based system either with the named shop primer or on bare prepared steel. The Type Approval Certificate shall reference the inspection report which will also form part of the Coating Technical File.

1.12 The Type Approval Certificate is invalid if the formulation of either the epoxy based system or the shop primer is changed. It is the responsibility of the coating manufacturer to inform the Administration immediately of any changes to the formulation.

Method C: Coating manufacturer

1.18 The coating/shop primer manufacturer shall meet the requirements set out in IACS UR Z17 paragraphs 4, 5, 6 and 7, (except for 4.6) and paragraphs 1.18.1 to 1.18.6 below, which shall be verified by the Administration.

1.18.1 Coating manufacturers

- (a) Extent of Engagement – Production of coating systems in accordance with PSPC-COT and this UI.
- (b) These requirements apply to both the main coating manufacturer and the shop primer manufacturer where both coatings form part of the total system.
- (c) The coating manufacturer should provide to the Administration the following information;
 - A detailed list of the production facilities.
 - Names and location of raw material suppliers will be clearly stated.
 - A detailed list of the test standards and equipment to be used, (scope of approval).
 - Details of quality control procedures employed.
 - Details of any sub-contracting agreements.
 - List of quality manuals, test procedures and instructions, records, etc.
 - Copy of any relevant certificates with their issue number and/or date e.g. Quality Management System certification.

- (d) Inspection and audit of the manufacturer's facilities will be based on the requirements of the PSPC-COT.
- (e) With the exception of early "scale up" from laboratory to full production, adjustment outside the limitations listed in the QC instruction referred to below is not acceptable, unless justified by trials during the coating system's development programme, or subsequent testing. Any such adjustments must be agreed by the formulating technical centre.
If formulation adjustment is envisaged during the production process the maximum allowable limits will be approved by the formulating technical centre and clearly stated in the QC working procedures.
- (f) The manufacturer's quality control system will ensure that all current production is the same formulation as that supplied for the Type Approval Certificate. Formulation change is not permissible without testing in accordance with the test procedures in the PSPC-COT and the issue of a Type Approval Certificate by the Administration.
- (g) Batch records including all QC test results such as viscosity, specific gravity and airless spray characteristics will be accurately recorded. Details of any additions will also be included.
- (h) Whenever possible, raw material supply and lot details for each coating batch will be traceable. Exceptions may be where bulk supply such as solvents and pre-dissolved solid epoxies are stored in tanks, in which case it may only be possible to record the supplier's blend.
- (i) Dates, batch numbers and quantities supplied to each coating contract will be clearly recorded.

1.18.2 All raw material supply must be accompanied the supplier's "Certificate of Conformance". The certificate will include all requirements listed in the coating manufacturer's QC system.

1.18.3 In the absence of a raw material supplier's certificate of conformance, the coating manufacturer must verify conformance to all requirements listed in the coating manufacturer's QC system.

1.18.4 Drums must be clearly marked with the details as described on the "Type Approval Certificate".

1.18.5 Product Technical Data Sheets must comply with all the PSPC-COT requirements. The QC system will ensure that all Product Technical Data Sheets are current.

1.18.6 QC procedures of the originating technical centre will verify that all production units comply with the above stipulations and that all raw material supply is approved by the technical centre.

1.19 In the case that a coating manufacturer wishes to have products which are manufactured in different locations under the same name, then IR identification and SG shall be used to demonstrate that they are the same coating, or individual approval tests will be required for the paint manufactured in each location.

1.20 The Type Approval Certificate is invalid if the formulation of either the epoxy based system or the shop primer is changed. It is the responsibility of the coating manufacturer to inform class immediately of any changes to the formulation. Failure to inform class of an alteration to the formulation will lead to cancellation of the certificates for that manufacturer's products.

Paragraph 4, table 1, section 1.4 – Job specification

Wet film thickness shall be regularly checked during application for quality control by the Builder. PSPC-COT does not state who should check WFT, it is accepted for this to be the Builder. Measurement of DFT shall be done as part of the inspection required in PSPC-COT 6.

Stripe coats should be applied as a coherent film showing good film formation and no visible defects. The application method employed should insure that all areas that require stripe coating are properly coated by brush or roller. A roller may be used for scallops, ratholes etc. but not for edges and welds.

Paragraph 4, table 1, section 2 – PSP (Primary surface preparation)

Section 2.2:

The conductivity of soluble salts is measured in accordance with ISO 8502-6 and ISO 8502-9 or equivalent method as validated according to NACE SP0508-2010, and compared with the conductivity of 50 mg/m² NaCl. If the measured conductivity is less than or equal to, then it is acceptable. Minimum readings to be taken are one (1) per plate in the case of manually applied shop primer. In cases where an automatic process for application of shop primer is used, there should be means to demonstrate compliance with PSPC-COT through a Quality Control System, which should include a monthly test.

Section 2.3:

Shop primers not containing zinc or not silicate based are considered to be "alternative systems" and therefore equivalency is to be established in accordance with section 8 of the PSPC-COT with test acceptance criteria for "alternative systems" given in section 3.1 (right columns) of appendixes 1 and 2 to annex 1 of PSPC-COT.

Procedure for review of Quality Control of Automated Shop Primer plants

1 It is recognized that the inspection requirements of PSPC-COT 6.2 may be difficult to apply to an automated shop primer plant and a Quality Control approach would be a more practical way of enabling compliance with the requirements of PSPC-COT.

2 As required in PSPC it is the responsibility of the coating inspector to confirm that the quality control procedures are ensuring compliance with PSPC-COT.

3 When reviewing the Quality Control for automated shop primer plants the following procedures should be included.

3.1 Procedures for management of the blasting grit including measurement of salt and contamination.

3.2 Procedures recording the following; steel surface temperature, relative humidity, dewpoint.

3.3 Procedures for controlling or monitoring surface cleanliness, surface profile, oil, grease, dust and other contamination.

3.4 Procedures for recording/measuring soluble salts.

3.5 Procedures for verifying thickness and curing of the shop primer conforms to the values specified in the Technical Specification.

Paragraph 4, table 1, section 3 – SSP (Secondary surface repair)

Sections 3.2, 3.3 and 3.4:

Usually, the fillet welding on tank boundary watertight bulkhead is left without coating on block stage (because not yet be leakage tested), in which case it can be categorized as erection joint ("butt") to be power tooled to St 3.

Section 3.6:

The conductivity of soluble salts is measured in accordance with ISO 8502-6 and ISO 8502-9, or equivalent method as validated according to NACE SP0508-2010, and compared with the conductivity of 50 mg/m² NaCl. If the measured conductivity is less than or equal to, then it is acceptable.

All soluble salts have a detrimental effect on coatings to a greater or lesser degree. ISO 8502-9:1998 does not provide the actual concentration of NaCl. The % NaCl in the total soluble salts will vary from site to site. Minimum readings to be taken are one (1) reading per block/section/unit prior to applying.

Paragraph 4, table 1, section 4 – Miscellaneous

Section 4.3:

All DFT measurements shall be measured. Only the final DFT measurements need to be measured and reported for compliance with the PSPC-COT by the qualified coating inspector. The Coating Technical File may contain a summary of the DFT measurements which typically will consist of minimum and maximum DFT measurements, number of measurements taken and percentage above and below required DFT. The final DFT compliance with the 90/10 practice shall be calculated and confirmed, see PSPC-COT 2.8.

Paragraph 4, table 1, section 5 – Coating system approval

See Interpretation of PSPC-COT table 1: 1 Design of coating system, 1.3 Coating prequalification test.

Paragraph 4, table 1, section 6 – Coating inspection requirements

Procedure for Assessment of Coating Inspectors' Qualifications

1 Coating inspectors required to carry out inspections in accordance with the PSPC-COT 6 shall be qualified to NACE Coating Inspector Level 2, FROSIO Inspector Level III, or an equivalent qualification. Equivalent qualifications are described in 3 below.

2 However, only coating inspectors with at least 2 years relevant coating inspector experience and qualified to NACE Coating Inspector Level 2 or FROSIO Inspector Level III, or with an equivalent qualification, can write and/or authorise procedures, or decide upon corrective actions to overcome non-compliances.

3 Equivalent Qualification

3.1 Equivalent qualification is the successful completion, as determined by course tutor, of an approved course.

3.1.1 The course tutors shall be qualified with at least 2 years relevant experience and qualified to NACE Coating Inspector Level 2 or FROSIO Inspector Level III, or with an equivalent qualification.

3.1.2 Approved Course: A course that has a syllabus based on the issues associated with the PSPC including the following:

- Health Environment and Safety
- Corrosion
- Materials and design
- International standards referenced in PSPC
- Curing mechanisms
- Role of inspector
- Test instruments
- Inspection procedures
- Coating specification
- Application procedures
- Coating failures
- Pre-job conference
- MSDS and product data sheet review
- Coating Technical File
- Surface preparation
- Dehumidification
- Waterjetting
- Coating types and inspection criteria
- Specialized application equipment
- Use of inspection procedures for destructive testing and non-destructive testing instruments.
- Inspection instruments and test methods
- Coating inspection techniques
- Cathodic protection
- Practical exercises, case studies.

Examples of approved courses may be internal courses run by the coating manufacturers or shipyards etc.

3.1.3 Such a course shall have an acceptable measurement of performance, such as an examination with both theoretical and practical elements. The course and examination shall be approved by the Administration.

3.2 Equivalent qualification arising from practical experience: An individual may be qualified without attending a course where it can be shown that the individual:

- has a minimum of 5 years practical work experience as a coating inspector of ballast tanks and/or cargo tanks during new construction within the last 10 years; and
- has successfully completed the examination given in 3.1.3.

4 Assistants to coating Inspectors

4.1 If the coating inspectors requires assistance from other persons to perform part of the inspections, those persons shall perform the inspections under the coating inspector's supervision and shall be trained to the coating inspector's satisfaction.

4.2 Such training should be recorded and endorsed either by the inspector, the yard's training organisation or inspection equipment manufacturer to confirm competence in using the measuring equipment and confirm knowledge of the measurements required by the PSPC-COT.

4.3 Training records shall be available for verification.

Paragraph 4, table 1, section 7 – Coating verification requirements

Procedure for Verification of Application of the PSPC-COT

1 The verification requirements of PSPC-COT 7 shall be carried out by the Administration.

1.1 Monitoring implementation of the coating inspection requirements, as called for in PSPC-COT 7.5 means checking, on a sampling basis, that the inspectors are using the correct equipment, techniques and reporting methods as described in the inspection procedures reviewed by the Administration.

2 Any deviations found under 1.1 shall be raised initially with the coating inspector, who is responsible for identifying and implementing the corrective actions.

3 In the event that corrective actions are not acceptable to the Administration or in the event that corrective actions are not closed out then the shipyard shall be informed.

4 Cargo Ship Safety Certificate or Cargo Ship Safety Construction Certificate, as appropriate, shall not be issued until all required corrective actions have been closed out to the satisfaction of the Administration.

Annex 1 – Footnotes of standards

Only the footnoted standards referred to in annex 1 are to be applied, i.e. they are mandatory.

ANNEX 8

BIENNIAL STATUS REPORT OF THE SUB-COMMITTEE FOR THE 2014–2015 BIENNIUM

SUB-COMMITTEE ON SHIP DESIGN AND CONSTRUCTION (SDC)								
Planned output number	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
1.1.2.3	Unified interpretation to provisions of IMO safety, security, and environment-related Conventions	Continuous	MSC / MEPC		III / PPR / CCC / SDC / SSE / NCSR	Continuous		MSC 78/26, paragraph 22.12; SDC 1/26, section 21
2.0.1.1	Provisions to ensure the integrity and uniform implementation of the 1969 TM Convention	2014	MSC	SDC	HTW	In progress		MSC 89/25, paragraph 22.34; SDC 1/26, section 4
Notes: Extend target completion year to 2015.								
2.0.1.7	Amendments to the ESP Code	Continuous	MSC	SDC		Continuous		MSC 91/22, paragraph 19.24; SDC 1/26, section 10
5.1.1.1	Guidelines on safe return to port for passenger ships	2014	MSC	SDC		In progress		MSC 81/25, paragraph 23.54; SDC 1/26, section 8
Notes: Extend target completion year to 2015.								

* Output description aligned with resolution A.1061(28).

Planned output number	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
5.1.1.2	Review of damage stability regulations for ro-ro passenger ships	2014	MSC	SDC		Completed		MSC 84/24, paragraph 22.59; SDC 1/26, section 6
5.1.1.3	Review of the recommendations on evacuation analysis for new and existing passenger ships	2015	MSC	SDC		In progress		MSC 83/28, paragraphs 8.7 and 25.25 SDC 1/26, section 13
5.1.1.5	Review of conditions under which passenger ship watertight doors may be opened during navigation and prepare amendments to SOLAS regulation II-1/22 and MSC.1/Circ.1380	2015	MSC	SDC		In progress		MSC 92/26, paragraph 23.17; SDC 1/26, section 25
Notes: Extend target completion year to 2015.								
5.2.1.3	Review of general cargo ship safety	2014	MSC		III / HTW / SDC / NCSR	In progress		MSC 90/28, paragraph 25.10; SDC 1/26, section 16
Notes: Extend target completion year to 2015.								
5.2.1.4	Guidelines addressing the carriage of more than 12 industrial personnel on board vessels engaged on international voyages	2015	MSC	SDC		In progress		MSC 92/26, paragraph 23.19; SDC 1/26, section 19

Planned output number	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
5.2.1.12	Second-generation intact stability criteria	2015	MSC	SDC		In progress		MSC 85/26, paragraph 12.7; SDC 1/26, section 5
5.2.1.13	Amendments to SOLAS chapter II-1 subdivision and damage stability regulations	2014	MSC	SDC		In progress		MSC 85/26, paragraph 23.35; SDC 1/26, section 7
Notes: Extend target completion year to 2015.								
5.2.1.15	Mandatory Code for ships operating in polar waters	2015	MSC / MEPC	SDC	HTW / PPR / SDC / SSE / NCSR	In progress		MSC 86/26, paragraph 23.32; SDC 1/26, section 3
Notes: Draft Code for SOLAS ships forwarded to MSC and MEPC for adoption. Work on non-SOLAS ships to begin at SDC 2.								
5.2.1.18	Interpretation of SOLAS regulation II-1/13.6 on means of escape from ro-ro cargo spaces	2014	MSC	SDC		In progress		MSC 90/28, paragraph 25.13; SDC 1/26, section 17
Notes: Extend target completion year to 2015.								
5.2.1.19	Classification of offshore industry vessels and a review of the need for a non-mandatory code for offshore construction support vessels	2015	MSC	SDC		In progress		MSC 85/26, paragraph 23.27; SDC 1/26, section 18

Planned output number	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
5.2.1.21	Guidelines for use of Fibre Reinforced Plastic (FRP) within ship structures	2014	MSC	SDC		In progress		MSC 87/26, paragraph 24.14; SDC 1/26, section 11
Notes: Extend target completion year to 2015.								
5.2.1.23	Guidelines for wing-in-ground craft	2015	MSC	SDC	HTW / SSE / NCSR	In progress		MSC 88/26, paragraph 23.30; SDC 1/26, section 20
5.2.1.24	Amendments to part B of the 2008 IS Code on towing, lifting and anchor handling operations	2014	MSC	SDC		In progress		MSC 88/26, paragraph 23.36; SDC 1/26, section 15
Notes: Extend target completion year to 2015.								
5.2.1.26	Amendments to SOLAS regulation II-1/11 and development of associated guidelines to ensure the adequacy of testing arrangements for watertight compartments	2015	MSC	SDC		In progress		MSC 86/26, paragraph 23.36; SDC 1/26, section 9
5.2.1.27	Amendments to SOLAS chapter II-2, the FTP Code and MSC/Circ.1120 to clarify the requirements for plastic pipes on ships	2014	MSC	SDC		In progress		MSC 88/26, paragraph 23.12; SDC 1/26, section 12
Notes: Extend target completion year to 2015.								

Planned output number	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
12.1.2.1	Analysis of casualty and PSC data to identify trends and develop knowledge and risk-based recommendations	Annual	MSC / MEPC	III	HTW / PPR / SDC / SSE / NCSR	In progress		MSC 92/26, paragraph 22.29; SDC 1/26, Paragraphs 24.5 and 24.6

ANNEX 9

PROPOSED PROVISIONAL AGENDA FOR SDC 2*

- Opening of the session
- 1 Adoption of the agenda
 - 2 Decisions of other IMO bodies
 - 3 Amendments to SOLAS chapter II-1 subdivision and damage stability regulations (5.2.1.13)
 - 4 Guidelines on safe return to port for passenger ships (5.1.1.1)
 - 5 Second-generation intact stability criteria (5.2.1.12)
 - 6 Amendments to the criterion for maximum angle of heel in turns of the 2008 IS Code (5.2.1.1)
 - 7 Amendments to part B of the 2008 IS Code on towing, lifting and anchor handling operations (5.2.1.24)
 - 8 Guidelines addressing the carriage of more than 12 industrial personnel on board vessels engaged on international voyages (5.2.1.4)
 - 9 Classification of offshore industry vessels and a review of the need for a non-mandatory code for offshore construction support vessels (5.2.1.19)
 - 10 Amendments to SOLAS regulation II-1/11 and development of associated Guidelines to ensure the adequacy of testing arrangements for watertight compartments (5.2.1.26)
 - 11 Development of a mandatory code for ships operating in polar waters (5.2.1.15)
 - 12 Provisions to ensure the integrity and uniform implementation of the 1969 TM Convention (2.0.1.1)
 - 13 Guidelines for use of Fibre Reinforced Plastic (FRP) within ship structures (5.2.1.21)
 - 14 Amendments to SOLAS chapter II-2, the FTP Code and MSC/Circ.1120 to clarify the requirements for plastic pipes on ships (5.2.1.27)
 - 15 Review of the recommendation on evacuation analysis for new and existing passenger ships (5.1.1.3)
 - 16 Interpretation of SOLAS regulation II-1/13.6 on means of escape from ro-ro cargo spaces (5.2.1.18)

* Agenda items are aligned with output titles in resolution A.1061(28), including the associated output number.

- 17 Review of conditions under which passenger ship watertight doors may be opened during navigation and development of amendments to SOLAS regulation II-1/22 and MSC.1/Circ.1380 (5.1.1.5)
- 18 Guidelines for wing-in-ground craft (5.2.1.23)
- 19 Review of general cargo ship safety (5.2.1.3)
- 20 Amendments to the 2011 ESP Code (2.0.1.7)
- 21 Unified interpretation to provisions of IMO safety, security, and environment-related Conventions (1.1.2.3)
- 22 Biennial agenda and provisional agenda for SDC 3
- 23 Election of Chairman and Vice-Chairman for 2016
- 24 Any other business
- 25 Report to the Maritime Safety Committee

ANNEX 10

STATEMENTS BY DELEGATIONS AND OBSERVERS*

AGENDA ITEM 3

STATEMENT BY THE DELEGATION OF AUSTRALIA

"Australia continues to support the completion of this work. The importance of a strong and effective Polar Code is underpinned by the recent example in East Antarctica, in which Australia and other Parties were involved.

Distinguished members of this Sub Committee will be aware of the incident in East Antarctica involving the **Akademik Shokalskiy**, flagged to the Russian Federation, which being trapped in heavy pack ice requested assistance on 25 December 2013.

Australia's joint Rescue Coordination Centre, as the authority for the relevant Search and Rescue Region, coordinated the response to the request. The Antarctic program vessels of France (**L'Astrolabe**), China (**Xue Long**), Australia (**Aurora Australis**) and the United States (Polar Star) diverted from their Antarctic support duties to respond. The **Akademik Shokalskiy** issued an INMARSAT Type C distress alert approximately 100 nautical miles east of Dumont D'Urville, Antarctica, within the Australian Search and Rescue Region. Australia's Rescue Coordination Centre made direct contact with the vessel and established that the ship's safety was being threatened by icebergs and this was being complicated by poor weather. The vessel had 22 crew and 52 passengers on board.

The **Xue Long** and the **L'Astrolabe** were the first on scene, transiting 483 and 650 nautical miles respectively, arriving on 27 December 2013, but were unable to break through the ice; **Xue Long** which carried a helicopter was requested to remain in the area if emergency evacuation of the 74 persons on board was required. The **Aurora Australis** arrived in the area after a transit of 1160 nautical miles but attempts to reach the **Akademik Shokalskiy** also failed. On January the 2nd, a rescue of the 52 passengers from the **Akademik Shokalskiy** was conducted using the helicopter embarked on the **Xue Long** to transfer passengers to the **Aurora Australis**. The **USCGC Polar Star** bound for McMurdo Station was diverted to assist in freeing the vessel under SAR provisions and departed Sydney on the 5th of January. Australia's Rescue Coordination Centre maintained a search and rescue phase on the incident which was cancelled two days later when the **Akademik Shokalskiy** freed herself from the ice and the **Polar Star** was released from SAR tasking.

In addition to the maritime functions associated with Australia's role in coordinating SAR activity, and the use of the **Aurora Australis** in the SAR response, Australia as a Party to the Antarctic Treaty, has a strong interest in ensuring that Antarctic activities, including the navigation of vessels, can be conducted safely and without environmental harm.

While the outcome of the incident was positive, with no harm to people or the environment, the potential for the incident to have significant consequences was high, and the cost of response and disruption to the responding Government Antarctic programs has been substantial.

* Statements have been included in this annex in the order in which they were given, sorted by agenda items, and in the language of submission (including translation into any other language if such translation was provided). Statements are available in all the official languages on audio file:
<http://docs.imo.org/Meetings/Media.aspx>

At this stage it is too early to report on any lessons learned from the incident response. We note, however, that the incident reinforces the importance of the development of the Polar Code and illustrates the hazards associated with operating in polar waters, including the complex issues that can arise from conducting a response in sea ice conditions. Had there been serious damage to **Akademik Shokalskiy** the need for 74 people to survive on the ice for an extended period awaiting rescue was a real possibility. Australia is pleased that the draft code includes provisions relating to emergency preparedness, survival, operations, structural strength and other elements which were significant in this incident.

Australia would like to reiterate its sincere thanks and appreciation to the Governments and national Antarctic programs of France, China, and the United States, and to the Masters and crews of the vessels and aircraft involved in the Search and Rescue response effort."

STATEMENT BY THE DELEGATION OF THE RUSSIAN FEDERATION

In response to the statement of the delegation of Australia

"Нам не хотелось обсуждать этот вопрос здесь, но поскольку заявление сделано, мы обязаны ответить.

Мы не совсем согласны с оценками, которые сделаны в этом устном заявлении. И выводы, которые сделаны, на наш взгляд, во-первых, преждевременны, во-вторых, не вполне соответствуют действительности.

Я хочу сказать, что вряд ли этот случай можно назвать инцидентом, как было заявлено австралийской делегацией. Действительно, судно "Академик Шокальский" под российским флагом оказалось в ледовых условиях, которые были ожидаемые, но не планировались быть встреченными. Судно "Академик Шокальский" имеет ледовый класс, достаточный для плавания в акваториях, где оно находилось. Оно было полностью укомплектовано всем необходимым, включая снабжение для длительного пребывания в море. Судно имеет пассажирский класс.

Решение об эвакуации пассажиров с судна было принято фрахтователем судна, австралийской компанией. Ни судовладелец, ни Российская Федерация как государство флага такое решение не принимали. И не было никакой необходимости это делать.

Мы не можем согласиться с австралийскими коллегами, заявившими о том, что была серьезная угроза как людям, так и окружающей среде. В нашем понимании это была обычная, штатная ситуация. Судно было готово к этой ситуации, включая его оборудование, корпус и экипаж. И как показало дальнейшее развитие событий, практически сразу после эвакуации пассажиров погода изменилась, подул благоприятный ветер и судно самостоятельно, без посторонней помощи проследовало в открытое море.

Я хотел бы подчеркнуть, что подобные преждевременные заявления вряд ли могут принести пользу нашим обсуждениям. Но с чем мы согласны в полной мере, так это с необходимостью разработки Полярного кодекса и с тем, чтобы этот документ включал в себя требования к судну и судовладельцу обеспечить готовность к подобному роду ситуаций."

STATEMENT BY THE DELEGATION OF THE RUSSIAN FEDERATION

"The delegation of the Russian Federation proposes to exclude the Northern part of the Bering Sea from the area of geographical applicability of the Polar Code for the following reasons:

- .1 unlike the Chukchi Sea situated to the North of the Bering Strait, and in which there is all year round probability of encountering a vessel with sea ice, the Bering Sea during long summer-autumn period is completely free of ice. The Bering Sea does not belong to the Arctic seas, but pertains to freezing ones, like the Sea of Okhotsk, Baltic, Caspian and other seas , partially covered only with first-year ice in winter;
- .2 in the Bering Sea there is no phenomenon of the polar night/polar day; and
- .3 the existing shipping traffic as well as the geographical particulars of the Bering Sea allow to render any assistance in emergency situations, if necessary.

The mentioned reasons show that the described area meets no main criteria to be covered under the provisions of the Polar Code."

STATEMENT BY THE DELEGATION OF CANADA

"It is Canada's view that it is important that the relationship between the Polar Code, other international agreements and international law is made clear in the amendments to MARPOL. Canada proposed language be included in the application sections of Annexes I, II, IV and V.

Canada is aware of article 9(2) of MARPOL. Nevertheless, Canada proposed this text for purposes of transparency and clarity, in light of the fact that the Polar Code will come into effect through two different Conventions. In light of the discussion in plenary regarding this proposal, Canada is willing to review and revise the language as follows:

"Nothing in the Polar Code shall prejudice the rights or obligations of states under international law as reflected in the 1982 UN Convention on the Law of the Sea."

AGENDA ITEM 4

STATEMENT BY THE OBSERVER FROM IFSMA

"IFSMA representing shipmasters wishes to thank the Distinguished Delegate of the United States for the considerable amount of work in producing the report of the correspondence group. Technical issues affecting safety are considerable. IFSMA accepts that there is no desire to open a Convention that is now almost half a century old. While appreciating that technical issues are complex and will have to be addressed eventually, the issue of crew accommodation can and should be addressed now, be this with a novel solution as suggested by Germany or a simple one such as the use of Net Tonnage. Seafarers deserve "*decent accommodation*" and companies that do train seafarers should not be penalised. Member States can ensure that the same revenue is raised from port charges but do not fall on ship owners that seek to ensure an adequate supply of trained personnel. IFSMA requests that this intervention is recorded in the report of the Sub-Committee."

STATEMENT BY THE DELEGATION OF INDIA

"These 42 items, though unresolved at the time of this session, remain important in our view for ensuring the integrity and uniform implementation of the 1969 TM Convention:

- A. Enclosed spaces
 - 1. Requirement of a deck above to bound enclosed space
 - 2. Treatment of temporary deck equipment
 - 3. Treatment of deck cargo bounded by enclosing structure
 - 4. Treatment of topside spaces of complex shape
 - 5. Treatment of hull spaces of complex shape
 - 6. Evaluating accessibility of mast, kingposts and supports
 - 7. Vertical truss structures
 - 8. Movable door assembly within a covered space
 - 9. Independent ventilators and air trunks
 - 10. Spaces fitted to outer structure boundary
 - 11. Devices for safety , fire protection and pollution prevention
 - 12. Machinery support structures
- B. Definition of deck, cover and partition
 - 13. Definition of awning
 - 14. Treatment of exterior spaces bounded by awnings
 - 15. Treatment of interior spaces bounded by awning-like materials
- C. Excluded spaces
 - 16. Shelves or other means for securing cargo or stores
 - 17. Impact of end-opening obstructions
 - 18. Excluding space opposite an end opening as recess
 - 19. Characteristics of end and side openings
 - 20. Deck structure height requirements for side openings
 - 21. Structures along the line of an opening
 - 22. Adjoining deck beams on end-openings
 - 23. Height of side opening railings
- D. Spaces open to the sea
 - 24. Treatment of spaces inside the hull as open to the sea
 - 25. Treatment of spaces outside the hull as open to the sea
 - 26. Treatment of moon pools
- E. Re-certification for changes affecting tonnage
 - 27. Remeasurement following alterations
 - 28. Remeasurement following net tonnage change
 - 29. Alterations to tonnage following remeasurement by another body
- F. International Tonnage Certificate (1969)
 - 30. Listing of spaces on the certificate
 - 31. Specifying the lengths of spaces on the certificate
 - 32. Listing excluded spaces on the certificate
 - 33. Keel laid or alteration date on the certificate
 - 34. Tonnage certificate attachments
 - 35. Transmitting copies of calculations and certificates upon flag change
- G. Applying interpretations
 - 36. Acceptance and retroactive application of interpretations
- H. Impact on working and living conditions
 - 37. Extending reduced gross tonnage to crew spaces
 - 38. Calculating a reduced gross tonnage parameter for crew spaces
 - 39. Use of multiple reduced tonnage parameters
 - 40. Treatment of crew accommodation spaces

- I. Certificate exemptions
 - 41. Single voyage exemption
- J. Cargo spaces
 - 42. Including cargo spaces in tonnage"

AGENDA ITEM 5

STATEMENT BY THE DELEGATION OF THE UNITED KINGDOM

"It is clear that significant work has already been completed to develop numerical assessment tools for this work item and we note that the purpose of the second-generation intact stability criteria is to develop suitable safety criteria for unconventional ships. Without under-stating the work already completed, the United Kingdom feels that this is an appropriate time to discuss the future of this item. The Sub-Committee will recall that at SLF 55, the United Kingdom expressed similar concerns which have not diminished.

Given the mathematical complexity of proposals for these non-mandatory tools, the significant time that it would take to fully validate the calculations, and taking into account the pressing workload of this Sub-Committee, the United Kingdom would question whether it is feasible to continue the work on this item at this point in time.

There is limited evidence of an industry-wide problem of incidents where intact stability is identified as the cause and, while the proposed tools may be of assistance, it might be necessary to discontinue the work on this item to allow the sub-committee to focus on more pressing issues.

We need to balance the achievements of the correspondence group to date while at the same time remaining pragmatic in our approach to stability regulation. In this regard, the sub-committee could present to MSC the completed work on level 1 and level 2 vulnerability criteria as tools for identifying unconventional ships which may be re-opened in the future, if at some point it is identified that an intact stability issue does exist."

AGENDA ITEM 7

STATEMENT BY THE OBSERVER FROM THE EUROPEAN COMMISSION

"We support your proposal to refer the submission by Japan to MSC 93 to be considered in conjunction with the report of the FSA expert group.

However, as this paper has been read by the delegates to this SDC meeting and as this paper has also been referred to by CESA in their submission SDC 1/7/6, these comments will influence the consideration of the matters under agenda items 6 and 7. Unfortunately, as the submission by Japan was only published on the day of the deadline for commenting submissions to SDC it was not possible to make these comments in the form of a commenting submission. Therefore, with this intervention, we would like to highlight the main points of the European Commission's response to Japan's paper. We will make a similar commenting submission to MSC 93.

Most importantly, the SDC delegates should be aware that these comments were already raised by Japan at the FSA experts group which did not agree with their points. Instead, they concluded that the EMSA and GOALDS studies were "*adequately conducted in accordance with the FSA Guidelines*" and that the "*Risk Control Options, recommended in both studies, could be supported from a cost effectiveness point of view*" (MSC 93/6/2).

To explain to the SDC delegates why the FSA experts did not agree with the comments made by Japan, and referred to by CESA in their submission, we would like to respond to the main comments made by Japan as follows:

- .1 The submissions by Japan and CESA state that EMSA2 and GOALDS figures for Potential Loss of Life are 10 to 1000 times higher than their estimate based on the same IHS-Fairplay data, and attribute the difference to an assumption in the EMSA2 and GOALDS studies that any serious flooding leads to the loss of all passengers and crew on board.

This is not the case with respect to either study. The EMSA2 study simulated the time to capsize and assumed 100% fatalities only if it was rapid (within 30 minutes); otherwise zero fatalities were assumed. Indeed, there have been several casualties that illustrate how a rapid capsize will involve large numbers of fatalities. The GOALDS study included different approaches on the percentage of expected fatalities but both studies still reached very similar results and recommendations. There is a low sensitivity to the percentage of fatalities assumed in the calculations. The cost-effectiveness of the Risk Control Options is insensitive to the percentage of casualties assumed.

- .2 Like Japan's study, EMSA2 and GOALDS also used IHS-Fairplay data. However Japan only considered incidents that involved fatalities. By using only data from accidents with fatalities it is based on a data set that is too small to be of relevance for infrequent/high consequence events. EMSA2 and GOALDS used the full collision data set, but only to establish the probability of collision, before using SOLAS 2009 and other tools to determine the probabilistic outcome.

- .3 Japan stated that SOLAS 90 passenger ships had zero fatalities "*except for only one accident of Costa Concordia*". In fact this is fully consistent with the EMSA2 findings regarding the expected frequency of severe accidents.

However, this illustrates a common misunderstanding of the research. Both EMSA2 and GOALDS studies considered a world fleet comprising SOLAS 2009 ships only, as it is the SOLAS 2009 standard for damage survivability that is being assessed. Historical data was used only to evaluate the incidence of collision. The damage survivability performance of SOLAS 90 ships, or ships designed to previous standards, is not relevant for the frequency of collisions and did not influence either study.

- .4 Japan argues that other risk control options might be considered instead of increasing "R", but do not offer any analysis. Their paper mentions evacuation and escape but as described above, the EMSA2 study only considered fatalities in case of rapid capsize within less than 30 minutes which is too rapid for realistic evacuation.

With regards to the submission SDC 1/7/6 by CESA, the following clarifications and comments can be provided:

- .1 CESA does not recognize the compelling need to modify damage stability regulations. However, compelling need has been demonstrated by several state of the art research projects to which several members of CESA have

contributed. These studies have been subjected to scrutiny and endorsed by the FSA Expert Group as mentioned earlier.

- .2 CESA reports that "*numerical time-domain flooding simulations show that the survivability of large cruise ships is in fact better than indicated by the attained index*". However, no data is presented to support this claim and there has been no standardization or verification of the results from flooding simulations.
- .3 CESA further reports that "*for the large cruise ships none of the RCO were cost-effective. For the medium-sized cruise ships only one RCO out of nine were cost-effective*". Firstly, this is not correct; for example for the large cruise ship there are several Risk Control Options (RCOs) that meet the Cost to Avert a Fatality criterion as can be seen in figures 21, 22 and 24 of SLF 55/INF.9. Furthermore, the number of Risk Control Options that are cost effective is irrelevant; one cost effective RCO demonstrates that risk can be reduced cost effectively.
- .4 Finally CESA refer to "strict grandfathering" and argue that "*any attempt to implement (technically and economically) significant safety amendments, which are limited in their applications to new ships only, could be considered as a failure to demonstrate the compelling need for their introduction*". However, paragraph 4.26 of the *Guidelines on the organization and method of work of MSC and MEPC and their subsidiary bodies* provides clear direction on how improvements to the safety of existing ships should be considered. This is not the "strict grandfathering" referred to by CESA and will require due consideration, possibly supported by further research, to also identify actions that are cost-effective for existing ships.

AGENDA ITEM 21

STATEMENT BY THE DELEGATION OF GREECE

"The delegation of Greece would like to provide comments (in regard to document SDC 1/21/6) on the "robustness" of criteria on the testing for alternative systems which are provided in appendix 1 and 2 of Annex 1 of the PSPC standard.

Appendix 1 is the "Marintek" wave tank test, which is used to test for corrosion and osmotic blistering and appendix 2 is a standard condensation chamber test, which is used to test for cold wall blistering. The test was originally set up to assess the performance of soft coatings. The reason these tests were used in the PSPC regulation is simply because they were the only internationally accepted tests. However, they were developed for different reasons and they are not the most appropriate tests for the purposes of this standard.

The requirements of annex 1 (Alternative systems) are sufficient to guarantee good performance of the coating system for any extended period of time, especially for a target life of 15 years. They are "short-term" tests. Any reasonable epoxy coating will achieve B-1 standard. This test does not rank coatings in terms of known service performance. Practically, it only gives confidence of non-serious failure within the traditional guarantee period of one or two years.

Based on the above it cannot be said that the criteria for testing of Alternative systems are really "rigorous". However, these tests were the only internationally accepted tests at the time. They were not really suitable for the purpose of the standard which requires "good" performance for 15 years.

Greece believes that one reason prompting the IACS's interpretation is the development and marketing of a certain "innovative" solvent free epoxy based coating which changes colour when the specified thickness (DFT) is reached. Based on this feature the manufacturer requested from RO's that only one coat of paint be approved as equivalent to the regulation, which for epoxy based systems requires 2 coats and 2 stripe coats.

Greece recalls that at the time of development of the PSPC regulation, solvent-free epoxy systems were well known and extensively discussed. It was decided then that being "solvent-free" is no reason to bypass any of the requirements of the regulation including that for 2 coats. Greece urges to continue to require that all epoxy-based systems which comply with the full requirements of regulation table 1, as already decided at MSC 92. In the opposite case Greece warns that, if this door is opened, then soon the regulation will become irrelevant.

Therefore, Greece urges once again, to delete paragraph 2.1 of the interpretation that refers to epoxy-based systems, which are not applied according to table 1 of PSPC in order to stop any attempt to create a loophole to the existing legal framework."
