INTERNATIONAL MARITIME ORGANIZATION

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SUB-COMMITTEE ON SHIP DESIGN AND CONSTRUCTION
6th session
Agenda item 13

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REPORT TO THE MARITIME SAFETY COMMITTEE

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LIST OF ANNEXES

1 GENERAL

1.1 The Sub-Committee on Ship Design and Construction (SDC) held its sixth session from 4 to 8 February 2019 at IMO Headquarters, chaired by Mr. K. Hunter (United Kingdom). The Vice-Chair of the Sub-Committee, Ms. T. Stemre (Norway), was also present.

1.2 The session was attended by delegations from Member States, an Associate Member of IMO, and observers from intergovernmental organizations and non-governmental organizations in consultative status, as listed in document SDC 6/INF.1.

Opening address

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

Chair's remarks

1.4 In responding, the Chair 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.

Adoption of the agenda and related matters

1.5 The Sub-Committee adopted the agenda (SDC 6/1) and agreed to be guided in its work, in general, by the annotations contained in document SDC 6/1/1 (Secretariat) and the arrangements in document SDC 6/1/2 (Chair).

2 DECISIONS OF OTHER IMO BODIES

General

2.1 The Sub-Committee noted the decisions and comments pertaining to its work made by MSC 99 and MSC 100, as reported in documents SDC 6/2 and SDC 6/2/1 (Secretariat), and took them into account in its deliberations when dealing with the relevant agenda items.

2.2 In particular, the Sub-Committee noted that MSC 99, following the consideration of the issues identified by the Secretariat in regard to practical application of the *Guidance on drafting amendments to the 1974 SOLAS Convention and related mandatory instruments* (MSC.1/Circ.1500), had approved MSC.1/Circ.1500/Rev.1.

2.3 The Sub-Committee also noted that MSC 99 had approved the establishment of an "MSC.7" circular series, dedicated to information related to the early implementation of amendments to the 1974 SOLAS Convention and related mandatory instruments.

2.4 With respect to the outcome at MSC 100, the Sub-Committee noted in particular the joint decision of MSC 100 and MEPC 73 that:

.1 Member States and international organizations could indicate at the time of submission whether their documents should be released to the public via IMODOCS prior to a meeting and, in the absence of such an indication, those documents would be kept private prior to the meeting of the committees;

.2 notes by the Secretariat would be made publicly available via IMODOCS prior to the meeting, unless the committees had decided otherwise in advance;

.3 sub-committees should follow the same practice as agreed for the committees; and

.4 all documents by the Secretariat expected to be submitted under agenda items of PPR 6, CCC 6, III 6, SDC 6, SSE 6 and HTW 6 would be made publicly available prior to the sessions.

Consequential amendments to the Guidelines for verification of damage stability requirements for tankers (MSC.1/Circ.1461)

2.5 In the absence of any submissions on the matter, the Sub-Committee reiterated the request of MSC 99 (MSC 99/22, paragraph 21.27) inviting proposals regarding consequential amendments to the *Guidelines for verification of damage stability requirements for tankers* (MSC.1/Circ.1461) for consideration under the agenda item "Any other business" with a view to avoiding the use of two different terms, i.e. "stability information" and "intact stability booklet".

Model Course 3.07 on Hull and Structural Surveys

2.6 In considering the request of MSC 100 in relation to the need, at the earliest opportunity and in consultation with the Secretariat in order to streamline the process, for the revision of model courses falling under the purview of the SDC Sub-Committee in accordance with the *Revised guidelines for the development, review and validation of model courses* (MSC-MEPC.2/Circ.15/Rev.1), the Sub-Committee agreed to consider the matter under agenda item 12 (Any other business) (see paragraphs 12.7 to 12.10).

Draft interim guidelines for the safety of ships using methyl/ethyl alcohol as fuel

2.7 The Sub-Committee, as requested by CCC 5 (CCC 5/13, paragraph 3.30 and annex 1) and subsequently instructed by MSC 100 (MSC 100/20, paragraph 11.6), decided to consider the provision of the draft interim guidelines for the safety of ships using methyl/ethyl alcohol as fuel, related to the limit for safe location of fuel tank(s) for consideration and advice to CCC 6, under agenda item 12 (Any other business) (see paragraphs 12.15 to 12.17).

3 REVISED SOLAS REGULATION II-1/3-8 AND ASSOCIATED GUIDELINES (MSC.1/CIRC.1175) AND NEW GUIDELINES FOR SAFE MOORING OPERATIONS FOR ALL SHIPS

GENERAL

3.1 The Sub-Committee recalled that SDC 5, to progress the work intersessionally, had re-established the Correspondence Group on Safe Mooring Operations with the terms of reference set out in paragraph 10.37 of document SDC 5/15.

3.2 The Sub-Committee also recalled that SDC 5 had agreed, in principle, to the draft revised SOLAS regulation II-1/3-8, as set out in annex 1 to document SDC 5/WP.3, for finalization at this session with a view to approval by MSC 101.

REPORT OF THE CORRESPONDENCE GROUP

3.3 The Sub-Committee considered the report of the Correspondence Group on Safe Mooring Operations (SDC 6/3), containing:

.1 draft new Guidelines on the design of mooring arrangements and the selection of appropriate mooring equipment and fittings for safe mooring (design Guidelines);

.2 draft new Guidelines for inspection and maintenance of mooring equipment including lines (nspection Guidelines);

.3 draft Revised guidance on shipboard towing and mooring equipment (MSC.1/Circ.1175/Rev.1); and

.4 proposed consequential amendments to relevant IMO instruments.

3.4 The Sub-Committee also had for its consideration the following documents related to the Correspondence Group's report:

.1 SDC 6/3/1 (Bahamas), expressing concerns on the inclusion of "applying a human-centred design approach" in draft SOLAS regulation II-1/3-8.7 as it would not constitute a verifiable standard against which appraisal of mooring arrangement or calculation/approval of the mooring line strength could be carried out;

.2 SDC 6/3/2 (Japan), proposing the deletion of the draft text related to "human-centred design approach" which is aimed at improving the "usability" of a system and thus could be misconstrued as prioritizing "usability" over "safety";

.3 SDC 6/3/3 (Japan), commenting on the draft Design guidelines and the draft Inspection guidelines, considers:

.1 it redundant and unnecessary to use the Working Load Limit (WLL) as an operational limit and to require monitoring or estimating the load acting on lines;

.2 it not appropriate to incorporate a quantitative requirement for the Line Design Breaking Force (LDBF) but instead to include a requirement that LDBF should not be less than the ship design minimum breaking load (MBL); and

.3 it not appropriate to include a requirement for load monitoring equipment; and

.4 SDC 6/3/4 (IACS), identifying a number of provisions in the new draft Design guidelines considered to be in need of clarification to facilitate their global and consistent implementation.

3.5 In considering the above documents, the Sub-Committee considered the following main outstanding issues in relation to the finalization of draft SOLAS regulation II-1/3-8.7, the draft new Design guidelines, the draft new Inspection guidelines and the draft revised guidance on shipboard towing and mooring equipment (MSC.1/Circ.1175/Rev.1):

.1 application and inclusion of the human-centred design approach;

.2 requirement for load monitoring equipment;

.3 approval of ships' towing and mooring arrangement plans; and

.4 definitions for WLL and LDBF.

Application and inclusion of the human-centred design approach

3.6 In considering the application and inclusion of the human-centred design approach, the Sub-Committee noted the following comments:

.1 defining, implementing and verifying of human-centred designs for mooring arrangements was difficult to achieve in a consistent manner and on a global scale;

.2 there were benefits of applying human-centred designs for mooring arrangements as such an approach would improve ship safety, usability, efficiency and cost-effectiveness in operations;

.3 human-centred designs could not be applied to mooring arrangements since the approach taken had been prescriptive and not risk-based;

.4 a human-centred design approach would ensure due regard to the *Human element vision, principles and goals for the Organization* (resolution A.947(23)); and

.5 while the human-centred design approach was not appropriate in the context of designing mooring arrangements, the provisions in the design Guidelines needed to address the human element.

3.7 After discussion, the Sub-Committee agreed not to include any reference on human-centred design in draft SOLAS regulation II-1/3-8.7 or the Design guidelines, but to task the Working Group to address human element issues, based on the proposal in document SDC 6/3/1.

Requirement for load monitoring equipment

3.8 In considering provisions requiring load monitoring equipment, the Sub-Committee noted the following comments:

.1 while load monitoring equipment might provide a false sense of safety and could not replace the physical inspection of mooring lines, it would be beneficial for the safe mooring of the ship;

.2 it was doubtful, in the absence of relevant information from manufacturers and without the necessary tools which could be used consistently, that the measurement of mooring line loading patterns for the assessment of the reduction in the design life and strength of mooring lines could be achieved by ships' personnel;

.3 the safe handling of mooring lines could not be achieved by requiring load monitoring equipment and relying on such equipment could even cause carelessness; and

.4 regardless of the use of load monitoring equipment, wear and tear conditions needed to continue to be established by the user.

3.9 Following the discussion, the Sub-Committee agreed not to include provisions requiring load monitoring equipment.

Approval of ships' towing and mooring arrangement plans

3.10 Some delegations raised the issue of whether or not the approach to be taken in devising new or amending instruments on mooring and towing arrangements would require ships' towing and mooring arrangement plans to be approved by the Administration and inquired whether the provisions that had been developed so far allowed for a consistent and global verification of plans.

3.11 Following a brief discussion, the Sub-Committee agreed to task the Working Group to consider the matter of approval of ships' towing and mooring arrangement plans further.

Use and definitions for strength requirements of mooring lines and equipment

3.12 The Sub-Committee noted the divergent views in the Correspondence Group on the use and definitions for strength requirements of mooring lines and equipment, such as Ship Design Minimum Breaking Load (MBL_{SD}), Working Load Limit (WLL), the relation between SWL and MBL and others, and agreed to task the Working Group to consider the matter further.

ESTABLISHMENT OF THE WORKING GROUP

3.13 Having considered the above matters, the Sub-Committee established the Working Group on Safe Mooring Operations and instructed it, taking into account the comments made and decisions taken in plenary, to:

.1 finalize the draft revised SOLAS regulation II-1/3-8, based on annex 1 to document SDC 5/WP.3, taking into account paragraphs 10.15 and 10.16 of document SDC 5/15 and documents SDC 6/3/1 and SDC 6/3/2;

.2 finalize the draft new Guidelines on the design of mooring arrangements and the selection of appropriate mooring equipment and fittings for safe mooring, based on annex 1 to document SDC 6/3, taking into account documents SDC 6/3/1, SDC 6/3/2 and SDC 6/3/4, and prepare a cover sheet for a draft MSC circular;

.3 finalize the draft Guidelines for inspection and maintenance of mooring equipment including lines, based on annex 2 to document SDC 6/3, and prepare a cover sheet for a draft MSC circular;

.4 finalize the draft Revised guidance on shipboard towing and mooring equipment (MSC.1/Circ.1175/Rev.1), based on annex 3 to document SDC 6/3, and prepare a revised cover sheet for a draft MSC circular;

.5 prepare the draft consequential amendments to relevant IMO instruments, taking into account paragraphs 30 to 32 of document SDC 6/3 and document SDC 6/3/4; and

.6 consider whether it is necessary to re-establish a correspondence group and, if so, prepare terms of reference for consideration by the Sub-Committee.

REPORT OF THE WORKING GROUP

3.14 Having considered the report of the Working Group on Safe Mooring Operations (SDC 6/WP.3), the Sub-Committee took action as outlined in paragraphs 3.15 to 3.22 below.

Amendments to SOLAS regulation II-1/3-8 and associated records of regulatory development

3.15 The Sub-Committee, in considering the draft amendments to SOLAS regulation II-1/3-8 and noting the Group's deliberation regarding documentation for design of mooring arrangements and the rationale of selection of the mooring equipment, noted the following view expressed:

.1 the deletion of the term "human-centred design approach" was appropriate;

.2 the need for clarity and objectivity required modification of draft SOLAS regulation II-1/3-8.7 as the Group recognized that it did not specify any type or details for the requirements for documentation (SDC 6/WP.3, paragraph 6) while the current draft text of SOLAS regulation II-1/3-8.7 required documentation for the "design of mooring arrangements and rationale of selection of the mooring equipment"; and

.3 the current draft SOLAS regulation II-1/3-8.7 did not provide the clarity needed to ensure global uniform implementation as uncertainty in regulatory compliance remained, in particular in the context of port State control.

3.16 Following the discussion, the Sub-Committee agreed to further modify draft SOLAS regulation II-1/3-8.7 to require ship-specific information to be kept on board and referring, in a footnote, to the Guidelines on the design of mooring arrangements and the selection of appropriate mooring equipment and fittings for safe mooring (see paragraph 3.18 below).

3.17 Subsequently, the Sub-Committee agreed to the draft amendments to SOLAS regulation II-1/3-8, as set out in annex 1, for submission to MSC 101 for approval and subsequent adoption.

Guidelines on the design of mooring arrangements and the selection of appropriate mooring equipment and fittings for safe mooring

3.18 The Sub-Committee agreed to the draft Guidelines on the design of mooring arrangements and the selection of appropriate mooring equipment and fittings for safe mooring and the associated draft MSC circular, as set out in annex 2, for submission to the Committee for approval in conjunction with the adoption of the draft amendments to SOLAS regulation II-1/3-8.

Guidelines for inspection and maintenance of mooring equipment including lines

3.19 The Sub-Committee agreed to the draft Guidelines for inspection and maintenance of mooring equipment including lines and the associated draft MSC circular, as set out in annex 3, for submission to the Committee for approval in conjunction with the adoption of the draft amendments to SOLAS regulation II-1/3-8.

Familiarization and training requirements of shore-based personnel

3.20 The Sub-Committee noted the lengthy discussion in the Group while developing the draft Inspection guidelines on the need for inclusion of provisions on training and familiarization of shore-based personnel.

3.21 Following discussion and noting that the matter of training and familiarization was outside the scope of the output, the Sub-Committee agreed to invite the Committee to consider what actions, if any, should be taken in this respect, taking into account FAL.6/Circ.11/Rev.1 on *Guidelines on minimum training and education for mooring personnel* (see also paragraph 13.4).

Revised guidance on shipboard towing and mooring equipment

3.22 The Sub-Committee agreed to the draft amendments to the *Guidance on shipboard towing and mooring equipment* (MSC.1/Circ.1175) and the associated draft MSC circular, as set out in annex 4, for submission to MSC 101, for approval in conjunction with the adoption of the draft amendments to SOLAS regulation II-1/3-8, for dissemination as MSC.1/Circ.1175/Rev.1.

COMPLETION OF THE WORK ON THE OUTPUT

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

4 REVIEW SOLAS CHAPTER II-1, PARTS B-2 TO B-4, TO ENSURE CONSISTENCY WITH PARTS B AND B-1 WITH REGARD TO WATERTIGHT INTEGRITY

GENERAL

4.1 The Sub-Committee recalled that MSC 96 had agreed to include in the 2018-2019 biennial agenda of the Committee an output on "Review SOLAS chapter II-1, parts B-2 to B-4, to ensure consistency with parts B and B-1 with regard to watertight integrity", with three sessions needed to complete the item, assigning the Sub-Committee as the coordinating organ.

4.2 The Sub-Committee also recalled that, at SDC 5, it had re-established the Correspondence Group on Subdivision and Damage Stability (SDS), with the terms of reference set out in paragraph 5.3 of document SDC 5/15, and instructed the Group to submit a report to this session.

REPORT OF THE SDS CORRESPONDENCE GROUP

4.3 The Sub-Committee considered the report of the SDS Correspondence Group (SDC 6/4), containing the draft SOLAS chapter II-1 amendments to parts B-1, B-2 and B-4 and proposing consequential amendments to the Explanatory Notes, as set out in annexes 1 and 2 of document SDC 6/4, respectively.

4.4 The Sub-Committee also had for its consideration the following documents related to the Correspondence Group's report:

.1 SDC 6/4/1 (Norway), proposing a number of minor amendments to parts B-2 to B-4 to ensure consistency with parts B and B-1 which have not been considered before, such as the use of onboard computers or shore-based support for damage control which were made mandatory for certain passenger ships and tankers;

.2 SDC 6/4/2 (IACS), proposing a "minor correction" to resolve IACS' perceived ambiguity in the interpretation of regulation II-1/17-1 concerning accesses that lead to spaces below the bulkhead deck so as to provide clarity for the provisions in paragraphs 1.2 and 1.3 of regulation II-1/17-1;

.3 SDC 6/4/3 (IACS), proposing to amend SOLAS regulations II-1/13.5.1 and II-1/13.6, to provide for remote operating positions in locations other than the navigation bridge and the location above the bulkhead deck where hand operation is provided, in light of the requirement in SOLAS regulation II-2/23.6 and available computer technologies;

.4 SDC 6/4/4 (United States), proposing application dates for the draft amendments of parts B-1, B-2 and B-4, whereby the nature of each draft amendment will determine the application date for existing and new ships;

.5 SDC 6/4/5 (Marshall Islands), objecting to the deletion of the prescriptive collision bulkhead valve type and location requirements in regulation II-1/12.6.1, as proposed by the SDS Correspondence Group, and requesting the regulation text to remain as adopted by resolution MSC.421(98), which will enter into force on 1 January 2020; and

.6 SDC 6/4/6 (China), objecting to the amendment to regulation II-1/7-2 for the following reasons:

.1 the amendment to regulation II-1/17.1 had already resolved the inconsistency between regulations II-1/7-2.5.2.1 and II-1/17.1;

.2 the amendment to regulation II-1/7-2.5.2.1 would be an amendment to part B-1 which was outside the scope of this output; and

.3 the draft requirements did not allow weathertight openings, including weathertight doors, to be immersed in the intermediate stages of flooding which was a deviation from the requirements of resolution MSC.216(82) and, up until that point, there had not been any cases where ship safety has adversely been affected by the current provisions.

4.5 In considering the above documents and the actions requested in paragraph 19 of the report of the Correspondence Group, the Sub-Committee approved the report in general and took the following decisions, as set out in paragraphs 4.6 to 4.16.

Proposed amendments to part B-1

4.6 In considering the proposal of the Correspondence Group to amend regulation II-1/7-2.5, which was developed to address the inconsistencies with regulation II-1/17.1 in respect to doors in bulkheads above the bulkhead deck, the Sub-Committee, taking into account the related comments in document SDC 6/4/6, noted the following views expressed during the discussion:

.1 while the proposal to amend SOLAS regulation II-1/7-2.5 (part B-1) was outside the scope of the current output, the task of ensuring consistency between parts B-2 to B-4 and parts B and B-1 with regard to watertight integrity necessitated the development of draft amendments SOLAS regulation II-1/7-2.5; and

.2 the draft amendments to regulation II-1/17.1 had already achieved consistency with the existing SOLAS regulation II-1/7-2.5 and amendments thereto would be beyond the scope of the output.

4.7 Following discussion, the Sub-Committee agreed that, while developing amendments to SOLAS regulation II-1/7-2.5 (part B-1) was outside the scope of the output, the solution proposed by the Correspondence Group was the most efficient and effective way to address the inherent inconsistencies in SOLAS regulation II-1/7-2.5.2.1 regarding doors in bulkheads above the bulkhead deck that are considered watertight in the damage stability calculations.

4.8 Consequently, the Sub-Committee endorsed the approach taken to solve the inconsistencies with respect to watertight integrity between the various parts B in SOLAS chapter II-1 and agreed, in principle, to the draft amendments to SOLAS regulation II-1/7-2.5, with a view to finalization by the SDS Working Group and subsequent endorsement by the Committee of the approach taken.

Type, location and operation of bulkhead valves

4.9 In considering the proposal in document SDC 6/4/5, the Sub-Committee noted the following comments in relation to the type of valve:

.1 reverting to the text of regulation II-1/12.6.1, as adopted by resolution MSC.421(98), would lead to further inconsistencies and the use of outdated provisions;

.2 document SDC 6/4 raised concerns on the deletion of the prescriptive collision bulkhead valve type and location requirements in regulation II-1/12.6.1 as a remotely operated valve was not considered to be a safe alternative to a screw-down valve in case of collision when the remote-control function could be lost;

.3 the current draft amendments to regulation II-1/12.6.1, developed by the SDS Correspondence Group, would not affect safety since the survivability requirements for the space located in front of the collision bulkhead had been enhanced by the revision of SOLAS regulation II-1/12.2, as adopted by resolution MSC.421(98); and

.4 a non-prescriptive valve type was a reasonable way forward.

4.10 In considering the above views, the Sub-Committee decided not to specify the type of valve to be used and agreed, in general, to the draft amendments to SOLAS regulation II-1/12.6.1, as prepared by the Correspondence Group.

4.11 In regard to the location and the mode of operation (remotely or not) of bulkhead valves, the Sub-Committee decided to instruct the Working Group to discuss this matter further and to develop draft amendments accordingly.

Application of the new draft amendments

4.12 In considering the application of the draft amendments together with the related proposal in document SDC 6/4/4, the Sub-Committee agreed to the proposal in the aforementioned document, in principle, and instructed the Working Group to further consider this matter.

Accesses that lead to spaces below the bulkhead deck

4.13 The Sub-Committee considered document SDC 6/4/2, proposing to amend SOLAS regulation II-1/17-1 to better reflect the original intent of the regulation to allow for exemptions/relaxations from the requirements for accesses that lead to spaces below the bulkhead deck and, having agreed, in principle, to the proposal, instructed the Working Group to further consider it in detail.

Watertight door remote control positions

4.14 In considering document SDC 6/4/3, the Sub-Committee expressed general support for the proposal to extend the remote operating positions for power-operated sliding doors to other locations (i.e. in addition to the navigation bridge) in light of the requirement in SOLAS regulation II-2/23.6 and the available computer technologies.

4.15 In addition, the following views were expressed:

.1 on many passenger ships the safety centre formed part of the navigation bridge and it was important that inputs, controls and indicators for watertight doors were located in the safety centre and not on the navigation bridge amidst other, unrelated, systems; and

.2 caution should be exercised as multiple operating positions for power-operated sliding doors could place the life of the crew at risk.

4.16 Following discussion, the Sub-Committee instructed the Working Group to further consider this matter.

ESTABLISHMENT OF THE WORKING GROUP

4.17 Having considered the above documents, the Sub-Committee established the Working Group on Subdivision and Damage Stability (SDS) and instructed it, taking into account the comments and decisions made in plenary, to further develop the draft amendments to SOLAS chapters II-1, parts B-1 to B-4 and on the related provisions in the Revised Explanatory Notes (resolution MSC.429(98)), taking into account documents SDC 6/4/1, SDC 6/4/2 and SDC 6/4/3 and, in particular, to (see also paragraph 9.10):

.1 finalize the draft amendments to regulation II-1/7-2.5.2, based on the text set out in the annexes to document SDC 6/4;

.2 consider amendments to regulation II-1/12.6.1 in relation to the location and operation of the collision bulkhead valve;

.3 further consider the draft application criteria for the amendments, based on the proposal contained in the annex to document SDC 6/4/4; and

.4 revise MSC.1/Circ.1464/Rev.1, based on the proposal in document SDC 6/9/1.

REPORT OF THE SDS WORKING GROUP

4.18 Having considered the relevant part of the report of the SDS Working Group (SDC 6/WP.5), the Sub-Committee took action as outlined in paragraphs 4.19 to 4.26 below.

Draft amendments to SOLAS regulation II-1/7-2.5

4.19 The Sub-Committee noted the Group's view that the inconsistency between regulations II-1/7-2.5 and II-1/17.1, regarding the treatment of openings in bulkheads above the bulkhead deck that were considered watertight in the damage stability calculations, only concerned passenger ships and that the Group had amended regulation II-1/7-2.5 accordingly. Consequently, the Committee was invited to endorse the approach taken by the Sub-Committee to amend part B-1 and to approve the draft amendments to SOLAS regulation II-1/7-2.5, as set out in paragraph 4.20 below and annex 5 (text in square brackets).

Finalization of draft amendments to SOLAS chapter II-1, parts B-1 to B-4

4.20 The Sub-Committee agreed to draft amendments to parts B-1 to B-4 of SOLAS chapter II-1, as set out in annex 5, for submission to MSC 101 for approval and subsequent adoption, taking into account the square brackets for SOLAS regulation II-1/7-2.5.

Revised Explanatory Notes to the SOLAS chapter II-1 subdivision and damage stability regulations (resolution MSC.429(98))

4.21 The Sub-Committee noted that, due to time constraints, the Working Group had been unable to consider the draft amendments to the Revised Explanatory Notes to the SOLAS chapter II-1 subdivision and damage stability regulations (resolution MSC.429(98)) and agreed to task the SDS Correspondence Group to further develop amendments thereto.

Proposed change of the output title

4.22 The Sub-Committee noted that, with the completion of the draft amendments to SOLAS chapter II-1, parts B-1 to B-4 to ensure consistency with parts B and B-1 with regard to watertight integrity, the only remaining outstanding work is the development of consequential amendments to the associated Explanatory Notes to SOLAS chapter II-1 subdivision and damage stability regulations (resolution MSC.429(98)) and agreed, therefore, to request the Committee to change the output title from "Review SOLAS chapter II-1, Parts B-2 to B-4, to ensure consistency with Parts B and B-1 with regard to watertight integrity" to "Amendments to the Explanatory Notes to SOLAS chapter II-1 subdivision and damage stability regulations (resolution MSC.429(98))".

Re-establishment of the SDS Correspondence Group

4.23 In order to progress the work on this output intersessionally, the Sub-Committee re-established the SDS Correspondence Group, under the coordination of the United States,[1] and instructed it, taking into account comments made and decisions taken at SDC 6, to:

.1 further develop draft amendments to the Revised Explanatory Notes to SOLAS chapter II-1 subdivision and damage stability regulations (resolution MSC.429(98)), but only to account for the draft amendments to SOLAS chapter II-1, parts B-1 to B-4, as set out in annex 1 of document SDC 6/WP.5;

.2 limit the scope to only reflect the impact of the regulation amendments;

.3 revise MSC.1/Circ.1572, based on the proposal in document SDC 6/9/1 (IACS) but limited to SOLAS requirements only (as amended up to resolution MSC.421(98)); and

.4 submit a report to SDC 7.

5 FINALIZATION OF SECOND GENERATION INTACT STABILITY CRITERIA

GENERAL

5.1 The Sub-Committee recalled that SDC 5 had re-established the Correspondence Group on Intact Stability with the terms of reference set out in paragraph 6.16 of document SDC 5/15 and instructed the Group to submit a report to SDC 6.

5.2 The Sub-Committee also recalled that SDC 5 had agreed to establish an Experts Group at this session to work towards the finalization of a draft package comprising of the levels 1 and 2 vulnerability criteria, the guidelines for direct stability assessment and the operational limitations and operational guidance.

5.3 The Sub-Committee further recalled that SDC 5 had agreed that the draft explanatory notes for all five stability failure modes, based on annex 19 to document SDC 5/INF.4 (Japan), should be finalized by the Correspondence Group on Intact Stability (IS) after completion of the complete draft package of levels 1 and 2 vulnerability criteria, for consideration at SDC 8.

5.4 The Sub-Committee recalled further that SDC 5 had agreed that, if the complete draft package was not presented in a state such that a drafting group could complete the work at SDC 7, with the exception of the draft explanatory notes for all five stability failure modes, the Committee should be advised that the Sub-Committee could not complete the output and, therefore, the work on this output should be considered "complete" and removed from the work programme of the Committee while any further work on this issue should then be proposed and justified by interested Member States in accordance with the Committees' procedures on the organization and method of work (MSC-MEPC.1/Circ.5/Rev.1).

[1] **Coordinator:**
Mr. James Person
Naval Architecture Division
U.S. Coast Guard Headquarters
Washington, DC 20593, United States
Tel: +1 (202) 372 1369
Email: james.l.person@uscg.mil

REPORT OF THE CORRESPONDENCE GROUP

General

5.5 The Sub-Committee considered part 1 of the report of the Correspondence Group on Intact Stability (SDC 6/5), which contains the following three draft guidelines:

.1 draft interim guidelines for the specification of direct stability assessment (annex 1);

.2 draft interim guidelines for the preparation and approval of operational limitations and operational guidance (annex 2); and

.3 draft interim guidelines on vulnerability criteria for the second generation of intact stability criteria (SDC 6/5, annex 3),

together with part 2 of the report (SDC 6/5/1), containing the detailed discussions of the Correspondence Group in developing the second generation intact stability criteria.

5.6 The Sub-Committee noted with appreciation the information collected by the Correspondence Group regarding the survey results on the draft guidelines of direct stability assessment procedures for use with the second generation intact stability criteria (SDC 6/INF.3), in support of document SDC 6/5/1.

5.7 In connection with the above, the Sub-Committee also noted with appreciation the information contained in documents SDC 6/INF.4, on direct stability assessment of excessive acceleration, and SDC 6/INF.5, on the direct stability assessment of parametric roll.

5.8 The Sub-Committee also had for its consideration the following additional documents related to the Correspondence Group's report:

.1 SDC 6/5/2 (China), proposing an amendment to paragraph 2.10.2.1 of the draft vulnerability criteria in part B of the 2008 Intact Stability Code, based on annex 1 to document SDC 2/WP.4, by adding an additional requirement for the GM calculation to solve the inconsistency of pure loss of stability Level 1 and 2 criteria;

.2 SDC 6/5/3 (China), providing the mathematical and ship model evidence to verify the reasonableness of the draft interim guidelines for direct stability assessment of pure loss of stability and proposing degrees on freedom and manoeuvring coefficients to be considered for different ship motions for the purpose of predicting pure loss of stability;

.3 SDC 6/5/4 (China), proposing, based on sample calculations conducted for eight fishing vessels and a tumblehome, to consider the wave diffraction effect for wave surging force computations when using the limited scatter table method to calculate the operational limit wave height and to add the operational limit "ship speed" for the surf-riding/broaching stability failure mode;

.4 SDC 6/5/5 (China), confirming, through an analysis, that the current set of draft criteria of pure loss of stability should not include ships with extended low weather decks;

.5 SDC 6/5/6 (Japan), proposing to assign high priority for the finalization of the draft guidelines with respect to the stability failure modes parametric rolling and surf-riding/broaching and to categorize the remaining three stability failure modes as low priority for finalization at SDC 7 in light of the further scientific research required for the latter; and

.6 SDC 6/5/7 (Japan), proposing to supplement the Interim guidelines on direct stability assessment with additional general descriptions of assessment methods with their application examples for all stability failure modes.

5.9 In considering the above documents and the action requested in paragraph 13 of part 1 of the Correspondence Group's report (SDC 6/5), as well as paragraph 23 of part 2 of the report (SDC 6/5/1), the Sub-Committee approved the report in general and took the following decisions, as set out in paragraphs 5.10 to 5.15 below.

Consideration of the five stability failure modes in the three sets of draft guidelines

5.10 In considering the three sets of draft guidelines listed in paragraph 5.5 above for each of the five stability failure modes (pure loss of stability, parametric roll, surf-riding/broaching, dead ship condition and excessive accelerations), the Sub-Committee noted the following general comments:

.1 the failure modes parametric rolling and surf-riding/broaching were sufficiently mature and should be assigned as a high priority to ensure their finalization at SDC 7 so that the three draft guidelines could be completed for these two failure modes;

.2 notwithstanding the above, work on the remaining stability failure modes should continue in an attempt to complete a package comprising all five stability failure modes in the three draft guidelines;

.3 the work should be completed for all five stability failure modes as a timely response to prevent stability-related ship accidents (e.g. **MV MSC Zoe**); and

.4 work should continue for all five stability failure modes, but if it became apparent that this work could not be achieved, the Experts Group should prioritize the work accordingly.

5.11 After a lengthy discussion, the Sub-Committee recalled that the work at this session was to be undertaken with a view to completing all three sets of guidelines across all five stability failure modes. Further to this, if, as a result of progress made at this session, it was considered that completion of these in a form suitable for finalization by a drafting group at the next session was considered likely, the Experts Group was to draft appropriate terms of reference for an intersessional correspondence group to take forward the work to completion.

5.12 In light of the above, the Sub-Committee agreed that, if finalization by a drafting group at the next session was considered unlikely, then the Experts Group should prioritize its work with a view towards producing all three sets of guidelines addressing the stability failure modes of parametric rolling and surf-riding/broaching only and prepare appropriate terms of reference for an intersessional correspondence group to work on the guidelines on the three stability failure modes and continue with the additional two stability failure modes only if it were considered that these could also be satisfactorily completed.

5.13 The Chair stressed that it was essential when making their decision on this matter to make an honest and objective assessment of the likelihood of completion.

Current weather criterion and the draft dead ship condition criteria

5.14 In considering the outcome of the Correspondence Group's discussion on the regulatory relationships between the current weather criterion and the draft dead ship condition criteria, the Sub-Committee noted the view that an alternative to the application of the weather criterion for the dead ship failure could only be addressed by the equivalent provisions in SOLAS or through MSC.1/Circ.1200 on *Interim guidelines for alternative assessment of the weather criterion*.

5.15 The Sub-Committee noted further a view that consideration or amendments of the weather criterion would be beyond the remit of the current output but might be considered by means of a new output.

ESTABLISHMENT OF THE EXPERTS GROUP

5.16 Having considered the above matters, the Sub-Committee established the Experts Group on Intact Stability and instructed it, taking into account the comments made and decisions taken in plenary, to:

.1 with a view to presenting outcomes ready for finalization at SDC 7, continue progressing:

.1 the draft Guidelines on the specification of direct stability assessment procedures, based on annex 1 of document SDC 6/5, taking into account documents SDC 6/5/1, SDC 6/5/3, SDC 6/5/5 and SDC 6/5/7, and include a preamble and/or introduction outlining the purpose of the guidelines and the intended target audience;

.2 the draft Guidelines for the preparation of operational limitations and operational guidance, based on annex 2 of document SDC 6/5, taking into account documents SDC 6/5/1, SDC 6/5/4 and SDC 6/5/5, and include a preamble and/or introduction outlining the purpose of the guidelines and the intended target audience; and

.3 the draft Guidelines on vulnerability criteria for the second generation of intact stability criteria, based on annex 3 of document SDC 6/5, taking into account documents SDC 6/5/1 and SDC 6/5/5, and include a preamble and/or introduction outlining the purpose of the guidelines and the intended target audience;

.2 assess the likelihood of successful presentation of outcomes in a form ready to be considered by a drafting group at SDC 7 and advise on whether the guidelines should continue to be taken forward for all stability failure modes; and

.3 prepare terms of reference for an intersessional correspondence group to take forward the work for completion at SDC 7.

REPORT OF THE EXPERTS GROUP

5.17 Having considered the report of the Experts Group on Intact Stability (SDC 6/WP.6), the Sub-Committee took action as outlined in paragraphs 5.18 to 5.23 below.

Dead ship stability failure mode

5.18 The Sub-Committee noted the Group's deliberations on the validity of dead ship condition and the regulatory relationship between the existing weather criterion and the draft dead ship condition criteria and the agreement in the Group that:

.1 the draft dead ship condition criteria should not be considered as an alternative for the existing weather criterion on the 2008 IS Code and, therefore, a draft text should be developed and included in the preamble/introductory section to highlight this;

.2 the purpose of the interim draft guidelines was to have a tool for addressing second generation intact stability criteria on the basis of the best "state-of-the-art" concepts, available at the time they were developed and, therefore, further improvements could be made on the basis of test results;

.3 recognizing the differences in their maturity level, sufficient explanations should be provided in the preamble/introductory section to reflect these differences; and

.4 the dead ship failure mode should not be excluded from the set of all five stability failure modes.

5.19 The delegation of Norway reiterated its concerns raised during the Group's discussion regarding the potential reduction of the level of safety when applying the dead ship vulnerability criteria without proper evaluation or justification.

Finalization and consolidation of the three sets of guidelines on the second generation intact stability criteria

5.20 The Sub-Committee noted that the Group had made significant progress on the three sets of draft interim guidelines, as listed in paragraph 5.5 above, and agreed to the Group's proposal to consolidate them into a single set of guidelines to include all five stability failure modes, with a view to finalization at SDC 7.

5.21 The Sub-Committee expressed its appreciation to the Experts Group members, its chair, as well as the members and the coordinator of the Intersessional Correspondence Group for the great progress made by resolving all technical matters, bearing in mind the difficulty encountered (see paragraph 5.4).

5.22 The Sub-Committee noted that only editorial and restructuring work remained, as well as the drafting of an introductory/preamble section, and recalled that the accompanying explanatory notes were expected to be finalized at SDC 8 (SDC 5/15, paragraph 6.13.4).

RE-ESTABLISHMENT OF THE CORRESPONDENCE GROUP

5.23 In order to progress the work on this output intersessionally, the Sub-Committee re-established the Correspondence Group on Intact Stability (IS), under the coordination of Japan,[2] and instructed it, taking into account the comments made and decisions taken at SDC 6, to:

.1 further develop the draft interim guidelines, based on annexes 1 to 3 to document SDC 6/WP.6, with a view to finalization at SDC 7 by means of a drafting group, and in particular, to:

.1 restructure the draft interim guidelines by taking annex 7 to document SDC 6/INF.3 as a base;

.2 consolidate all three draft interim guidelines under a single set of guidelines, namely:

.1 draft interim guidelines on vulnerability criteria for the second generation of intact stability criteria;

.2 draft interim guidelines on the specification of direct stability assessment procedures; and

.3 draft interim guidelines on the preparation of operational limitations and operational guidance;

.3 make minor improvements, clarifications and edits for consistency; and

.4 prepare the associated cover note for the draft MSC circular;

.2 develop a preamble/introductory section of the draft interim guidelines;

.3 prepare draft explanatory notes, with a view to consideration and finalization at SDC 8, taking into account contributions made during the intersessional discussions; and

.4 submit a report to SDC 7.

[2] Coordinator:
Dr Eng. Naoya Umeda
Professor
Department of Naval Architecture
and Ocean Engineering
Osaka University
2-1 Yamadaoka, Suita
Osaka 565-0871, JAPAN
Tel: + 81 6 6879 7587
FAX: + 81 6 6879 7594
Email: umeda@naoe.eng.osaka-u.ac.jp

6 MANDATORY INSTRUMENT AND/OR PROVISIONS ADDRESSING SAFETY STANDARDS FOR THE CARRIAGE OF MORE THAN 12 INDUSTRIAL PERSONNEL ON BOARD VESSELS ENGAGED ON INTERNATIONAL VOYAGES

GENERAL

6.1 The Sub-Committee recalled that MSC 97 had adopted the *Interim recommendations on the safe carriage of more than 12 industrial personnel on board vessels engaged on international voyages* (resolution MSC.418(97)) and endorsed the view that the proposed definitions of industrial personnel and offshore industrial activities should be the basis for the development of the mandatory instrument.

6.2 The Sub-Committee also recalled that MSC 99 had noted the principles and decisions that had been considered by SDC 5 as the basis for the development of the draft new SOLAS chapter XV and the draft new code (SDC 5/15, paragraphs 7.4 and 7.6), addressing safety standards for the carriage of more than 12 industrial personnel on board vessels engaged on international voyages.

6.3 The Sub-Committee further recalled that, at SDC 5, it had re-established the Correspondence Group on Industrial Personnel (IP), with the terms of reference set out in paragraph 7.21 of document SDC 5/15, and instructed the Group to submit a report to SDC 6.

PART 2 OF THE REPORT OF THE WORKING GROUP

6.4 Having considered part 2 of the report of the Working Group on Industrial Personnel established at SDC 5 (SDC 6/6), the Sub-Committee, bearing in mind that the IP Correspondence Group had already considered the matters outlined in the report during its deliberations, approved part 2 of the report in general.

REPORT OF THE CORRESPONDENCE GROUP

General

6.5 The Sub-Committee considered the report of the IP Correspondence Group (SDC 6/6/1), providing the latest draft of SOLAS chapter XV and the associated draft IP Code.

6.6 In this regard, the Sub-Committee also had for its consideration the following documents related to this issue:

.1 SDC 6/6/2 (China), proposing that crews on ships subject to the IP Code should be required to receive special training, such as STCW crowd and crisis management training and human behaviour training;

.2 SDC 6/6/3 (Norway), containing a proposal for the goals, functional requirements and regulations for the carriage of dangerous goods and hazardous liquid substances while carrying industrial personnel for inclusion in the draft IP Code for consideration by the CCC and PPR Sub-Committees as a matter of priority; and

.3 SDC 6/6/4 (Islamic Republic of Iran), proposing to extend the application of the new draft IP Code to include non-propelled accommodation barges used in support of offshore units that may or may not be engaged on international voyages and to define special ship category for those ships carrying more than 12 industrial personnel, including a new ship registration certificate.

6.7 In considering the above documents and the actions requested in paragraph 19 of document SDC 6/6/1, the Sub-Committee approved the report in general and took the following decisions, as set out in paragraphs 6.8 to 6.20.

Category of personnel to which new SOLAS chapter XV and IP Code apply

6.8 The Sub-Committee noted the divided views within the Correspondence Group (SDC 6/6/1, paragraphs 5 and 6 and annex 1) in regard to the use of the aggregated total maximum number of passengers, industrial personnel and special personnel (SP) as the application requirement.

6.9 In considering the above matter, the Sub-Committee noted the following comments:

.1 MSC 99 had agreed to the use of aggregated number of persons to establish the applicability of the IP Code and the Sub-Committee should not overturn its decision;

.2 a clear distinction of the provisions in the SPS Code and the draft IP Code should be preserved so as to provide the necessary clarity for the application of the two instruments;

.3 a ship not intended to carry any IP could not be required to comply with the IP Code, regardless of the number of special personnel or passengers to be carried on board;

.4 a shipowner seeking certification against the IP Code might not actually carry IP, similar to a passenger ship that might not carry any passengers;

.5 the introduction of an aggregated number of persons as a criterion for the application of an IMO instrument broke with the customary logic of the Organization to clearly define the application of regulations (e.g. passenger ships carry passengers, SPS carry SP) and thus would cause significant confusion;

.6 as currently drafted, SOLAS chapter XV was contradictory in that it stated that passengers should be counted towards the total number for application of the IP Code but, at the same time, IP should not be treated as passengers;

.7 even though IP and SP shared many common elements, such as a training requirement, their vessel designs would remain specialized and different from each other and, as currently drafted, it could be interpreted that 13 IP could be interpreted as turning an SPS ship into an IP ship, which was not the intention;

.8 a provision should be included in the draft IP Code that clearly stated that an IP Code ship should not carry more than 12 passengers; and

.9 as currently drafted, ships carrying a combined number of more than 12 SP and passengers, but without any IP, would be required to comply with the IP Code and thus would render the SPS Code redundant.

6.10 The delegation of Australia highlighted the conflict between the current definition in SOLAS chapter I for passengers and the proposed definition of industrial personnel in draft SOLAS chapter XV, which was flawed and would result in special personnel and special purpose ships unfairly treated compared to industrial personnel. This could be addressed by

deeming industrial personnel to include special personnel, as defined in the SPS Code. The delegation, fully aware that this proposal would require a change of scope of the current output, informed the Sub-Committee that they intended to submit a document on the matter to MSC 101. The full text of their statement is set out in annex 15.

6.11 Following discussion, the Sub-Committee agreed that using an aggregated number of passengers, special personnel and industrial personnel to invoke the application of the IP Code had caused confusion, ambiguity and differing interpretations among delegations, which contradicted the Organization's *Guidance on drafting of amendments to the 1974 SOLAS Convention and related mandatory instruments* (MSC.1/Circ.1500/Rev.1, paragraph 2.1.1).

6.12 Given the aforementioned difficulties in the application of draft SOLAS chapter XV and the draft IP Code, the Sub-Committee agreed to seek the Committee's direction on this issue and instructed the IP Working Group to continue developing both draft instruments without further deliberating the categories of personnel to which SOLAS chapter XV and the IP Code would apply. Subsequently, the Sub-Committee invited MSC 101 to consider the above issue and decide whether the use of an aggregated number, as agreed at MSC 99 (MSC 99/22, paragraph 10.17.1), should be maintained for the application of SOLAS chapter XV and the draft IP Code.

Crew training and requirements for ship drills

6.13 The Sub-Committee considered document SDC 6/6/2, proposing that crews on IP ships should be required to receive special training, such as STCW crowd and crisis management training and human behaviour training, and noted the following comments:

.1 while basic safety knowledge for IP was required and supported, crisis and crowd management training was considered unnecessary as IP would, in an emergency, not require crew assistance;

.2 IP Code provisions were based on a cargo ship concept which did not foresee a large number of people on board and consideration to include a threshold number to ensure safety of all persons on board might be appropriate; and

.3 special training requirements for crews serving on IP ships might be required with large numbers of IP on board for which an IP threshold value could be devised for inclusion in the Code.

6.14 Following the discussion, the Sub-Committee, while agreeing that a new requirement for additional specialized training for crew on IP Code vessels would impose an additional burden, reasoned that crews of IP ships might still require such training depending on the number of IP being carried and agreed that this matter might require further consideration.

6.15 In concluding on this matter, the Sub-Committee did not agree to the proposal in document SDC 6/6/1 regarding additional specialized training for IP, but concurred that the issue of a threshold value of people on board IP ships might need to be further considered by the Working Group in regard to specialized training for crews of such ships.

Application of SOLAS chapter XV and the IP Code to non-SOLAS ships

6.16 The Sub-Committee, in considering document SDC 6/6/4, proposing to extend the application of the new draft IP Code to include non-propelled accommodation barges used in support of offshore units but that might or might not be engaged on international voyages, noted the following comments on the matter:

.1 the proposal demonstrated the confusion that currently existed with respect to the application of draft SOLAS chapter XV and the draft IP Code;

.2 the application of SOLAS chapter XV to non-SOLAS ships was not feasible;

.3 defining the applicability of the Code in terms of a maximum time from a place of safety was relevant for HSC but not for displacement ships; and

.4 the inclusion of ships below 500 GT was very relevant since small vessels were often used for servicing offshore installations, particularly European wind farms; excluding such smaller service vessels would lead to a situation whereby the Code would only regulate a small fraction of the total fleet of ships carrying IP and thus causing inconsistencies in safety standards across vessels of the offshore industry.

6.17 Following discussion, the Sub-Committee decided not to expand the application of the draft IP Code to non-SOLAS ships.

Proposal to develop requirements for the carriage of dangerous goods and hazardous liquid substances while carrying industrial personnel

6.18 In considering document SDC 6/6/3, proposing to include provisions in the draft IP Code on the carriage of dangerous goods and hazardous liquid substances while carrying industrial personnel, the Sub-Committee noted the following comments:

.1 as IP were not considered passengers under the new draft SOLAS regulation, there was no need for additional requirements for an IP ship when carrying dangerous goods or hazardous liquid substances;

.2 a ship permitted to carry dangerous goods or hazardous liquid substances under the relevant IMO instruments should not be restricted simply because it was carrying IP; and

.3 the draft SOLAS regulations could be expanded if the number of IP on board was considered to introduce a risk.

6.19 Following the discussion, the Sub-Committee agreed that this matter should be considered further by the Working Group to develop provisions depending on a threshold number of IP while carrying dangerous goods and/or hazardous liquid substances. In this respect, any advice sought from other expert sub-committees, such as the CCC and PPR Sub-Committees, should be clear and unambiguous.

ESTABLISHMENT OF THE WORKING GROUP

6.20 Having considered the above issues, the Sub-Committee established the Working Group on Carriage of More than 12 Industrial Personnel (IP) On Board Vessels Engaged on International Voyages and instructed it, taking into account the documents submitted for consideration at this session and the comments made and decisions taken in plenary, to:

.1 further develop the draft IP Code, based on annex 2 of document SDC 6/6/1 and, in particular, consider provisions in the draft code addressing the carriage of dangerous goods and hazardous and noxious liquid substances, based on document SDC 6/6/3, with a view to identifying issues, if any, to refer to other sub-committees, as appropriate; and

.2 consider whether it is necessary to re-establish the Correspondence Group and, if so, prepare terms of reference for consideration by the Sub-Committee.

REPORT OF THE WORKING GROUP

General

6.21 Having considered part 1 of the report of the IP Working Group (SDC 6/WP.4),[3] the Sub-Committee took action as outlined in paragraphs 6.22 to 6.29 below.

6.22 The Sub-Committee noted the further developments in the Working Group on the draft IP Code which included:

.1 changes to the definition of "offshore industrial activities";

.2 finalization, in principle, of the goals and functional requirements in part II of the draft IP Code;

.3 further work on part III (regulations) including the common understanding that ships to which the draft Code applied would have cargo ship certification in accordance with chapter I of SOLAS as a "base-line"; and

.4 separate provisions for high-speed craft in the draft IP Code.

Threshold value harmonization between the draft IP Code and the SPS Code

6.23 Considering the discussion in the Group, the Sub-Committee agreed to apply, with the exception of the HSC Code, the threshold values used in the SPS Code, i.e. the number of persons on board for ships other than high-speed craft would be:

.1 not more than 60;

.2 more than 60 but not more than 240; and

.3 more than 240,

which should, whenever possible, be applied when developing relevant regulations in the draft Code.

[3] The IP Working Group carried on working after finalizing part 1 of its report and part 2 is expected to be submitted for consideration at SDC 7.

Carriage of dangerous goods

6.24 In considering the Group's deliberations and outcome on the parts of the draft IP Code that relate to the carriage of dangerous goods, the Sub-Committee agreed that the following sections should be referred to:

.1 the CCC Sub-Committee, for consideration of sections:

3.1.8.1 Carriage of dangerous goods in packaged form, in particular for consideration of thresholds of number of persons in relation to the requirements of IMDG Code;

3.1.8.2 Carriage of dangerous goods in solid form in bulk, in relation to the applicability of the IMSBC Code to ships carrying industrial personnel;

3.1.8.4 Carriage of liquefied gases in bulk, in relation to the applicability of the IGC Code to ships carrying industrial personnel; and

X.x.x.x Possible inclusion of dangerous goods carried as part of the stores on board ships, presently addressed in the SPS Code; and

.2 the PPR Sub-Committee, for consideration of sections:

3.1.8.3 Carriage of dangerous liquid chemicals in bulk, in relation to the applicability of the IBC Code to ships carrying industrial personnel; and

3.1.8.5 Transport and handling of dangerous chemicals in bulk on Offshore Support Vessels, in relation to the requirements of the OSV Chemical Code to ships carrying industrial personnel.

6.25 In this regard, the Sub-Committee agreed with the Group's view that, given the close proximity of PPR 6, experts attending PPR 6 should be invited, under PPR's agenda item 2 (Decisions of other IMO bodies), to join the SDC Sub-Committee's IP Correspondence Group (see paragraph 6.29) in order to provide input before PPR 7 formally considered the above sections.

6.26 One delegation raised the issue of including provisions in the draft IP Code on the carriage of dangerous goods as part of the ship's stores, rather than cargo, as provided for in the SPS Code.

6.27 In response to the issue raised in paragraph 6.26 above, the Group's rationale for not including any text to that effect was their opinion that IP, when carrying dangerous substances, would carry such dangerous substances with them when disembarking the ship, while SP would use them on board.

6.28 The Sub-Committee subsequently agreed to refer the issue to the CCC Sub-Committee for consideration (see paragraph 6.24.1).

RE-ESTABLISHMENT OF THE CORRESPONDENCE GROUP

6.29 In order to progress the work on this output intersessionally, the Sub-Committee re-established the Correspondence Group on Industrial Personnel, under the coordination of Norway,[4] and instructed it, taking into account the comments made and decisions taken at SDC 6, as well as relevant information contained in documents SDC 6/6/1 and SDC 6/6/3, and the outcome of the Working Group outlined in SDC 6/WP.4, to:

.1 further develop the draft new IP Code; and

.2 submit a report to SDC 7.

7 AMENDMENTS TO THE 2011 ESP CODE

GENERAL

7.1 The Sub-Committee recalled that MSC 99 had approved the draft MSC resolution on *Amendments to the 2011 ESP Code*, prepared by SDC 5 in accordance with the procedure for undertaking regular updates of the Code, as agreed at DE 57 (DE 57/25, paragraph 24.5) and concurred with by MSC 92, for entry into force on 1 July 2020.

7.2 The Sub-Committee also recalled that SDC 4 had requested the IMO Secretariat and IACS to prepare a draft consolidated text of the ESP Code and that SDC 5 had agreed to proceed with the development of the draft consolidated version of the ESP Code, based on the above-mentioned amendments and the outcome of the intersessional review of the existing footnotes, with a view to preparing a draft Assembly resolution for adoption of the draft consolidated version of the ESP Code, revoking resolutions A.744(18) and A.1049(27), for consideration and finalization at SDC 6, taking into account the related outcome of MSC 100 and subsequent submission to MSC 101 for endorsement and for final adoption at A 31.

7.3 The Sub-Committee further recalled that MSC 100, after having considered the draft amendments to the 2011 ESP Code set out in documents MSC 100/3 (Secretariat) and MSC 100/3/2 (IACS and Secretariat), decided to:

.1 hold the adoption of the draft amendments to the 2011 ESP Code in abeyance and invited IACS to work together with the Secretariat intersessionally to prepare a revised set of draft amendments to the Code using "shall/should" instead of "is to/are to", as appropriate, for submission to MSC 101 with a view to adoption; and

.2 instruct the SDC Sub-Committee to ensure that the draft 2019 ESP Code, expected to be finalized by SDC 6 with a view to approval by MSC 101 and subsequent submission to A 31, includes the aforementioned revised draft amendments to the 2011 Code.

[4] **Coordinator:**
Mrs. Turid Stemre
Director IMO Affairs
International environment, safety and security
P.O. Box 2222
N-5509 Haugesund, Norway
Tel: +47 52 74 51 51
Email: tbs@sdir.no

CONSIDERATION OF THE DRAFT CONSOLIDATED VERSION OF THE 2019 ESP CODE

7.4 The Sub-Committee had for its consideration the draft 2019 ESP Code, as set out in documents SDC 6/7, SDC 6/7/Add.1, SDC 6/7/Add.2 and SDC 6/7/Add.3 (Secretariat and IACS), which included the associated draft Assembly resolution.

7.5 Recalling the decision of MSC 100 on the amendments to the 2011 ESP Code (see paragraph 7.3), the Sub-Committee agreed that the drafting group to be established should harmonize the text of the draft 2019 ESP Code with the draft amendments to the 2011 ESP Code, as appropriate.

ESTABLISHMENT OF THE DRAFTING GROUP

7.6 Having considered the above documents, the Sub-Committee established the Drafting Group on Amendments to the 2011 ESP Code and instructed it, taking into account the comments made and decisions taken in plenary, to finalize the text of the consolidated new version of the ESP Code (2019 ESP Code), including the associated draft Assembly resolution, using document SDC 6/7 and addenda as the base documents, incorporating changes from the draft amendments to the 2011 ESP Code, as appropriate, taking into account document MSC 100/3/2.

REPORT OF THE DRAFTING GROUP

7.7 Having considered the report of the Drafting Group on Amendments to the 2011 ESP Code (SDC 6/WP.7), the Sub-Committee took action as outlined in paragraphs 7.8 to 7.14 below.

Use of the term "Administration"

7.8 The Sub-Committee noted the discussion on the use and definition of the term "Administration" in the context of the draft consolidated ESP Code as being synonymous to "Administration or organization recognized by the Administration".

Deletion of the term "exclusive" in connection with "surveyor"

7.9 Taking into account the current survey practices, the Sub-Committee agreed to the deletion of the word "exclusive" when referring to surveyors in section 1.4, the text of which now reads:

> "… the survey of hull structure and piping systems to which this Code applies ~~is to~~ shall be carried out by at least two ~~exclusive~~ surveyors of an Administration ~~recognized organization~~."

Other matters

7.10 The Sub-Committee noted the discussions of the Group on intermediate surveys, minimum requirements and the definition of corrosion prevention system.

7.11 The delegation of China raised concerns regarding the use of the term "owner" in the draft consolidated ESP Code, which they believed should be replaced by the term "company", as defined in SOLAS regulation IX/1.2.

7.12 The Sub-Committee noted that this change was discussed at a very late stage in the Drafting Group and, therefore, this matter could not be further considered due to the high number of occurrences of the term in the draft ESP Code. Subsequently, the Sub-Committee invited the delegation of China to submit a commenting document to MSC 101 in this regard.

7.13 The Sub-Committee authorized the Secretariat to make any further necessary editorial changes to the draft consolidated ESP Code, as appropriate.

FINALIZATION OF THE 2019 ESP CODE

7.14 Having considered the above matters, the Sub-Committee agreed to the draft International Code on the Enhanced Programme of Inspections During Surveys of Bulk Carriers and Oil Tankers, 2019 (2019 ESP Code), and the associated draft Assembly resolution, as set out in annex 6 (SDC 6/13/Add.1), for submission to MSC 101 for approval with a view to subsequent adoption by A 31.

Completion of the work on the output

7.15 The Sub-Committee invited the Committee to note that the work on this output had been completed.

8 SAFETY MEASURES FOR NON-SOLAS SHIPS OPERATING IN POLAR WATERS

GENERAL

8.1 The Sub-Committee recalled that MSC 98, after noting the decision of SDC 4 that no further action could be taken with regard to the second phase of the International Code for Ships Operating in Polar Waters (Polar Code) without receiving clear policy guidance, had agreed to change the title of the output "Application of the Mandatory Code to non-SOLAS ships operating in polar waters" to "Safety measures for non-SOLAS ships operating in polar waters".

8.2 The Sub-Committee also recalled that MSC 98 had agreed to include the aforementioned output in the provisional agenda of MSC 99, with a view to taking a policy decision regarding the scope of application of the second phase of work on the Polar Code, its mandatory or recommendatory status and types of vessels to be addressed.

8.3 The Sub-Committee further recalled that MSC 99, having agreed, inter alia, that any safety measures for non-SOLAS vessels should, in principle, apply to both Arctic waters and the Antarctic area, had instructed SDC 6 to develop recommendatory safety measures for the following types of ships operating in polar waters:

.1 fishing vessels of 24 m in length and over, with a view to alignment with the 2012 Cape Town Agreement; and

.2 pleasure yachts above 300 gross tonnage (GT) not engaged in trade.

8.4 The Sub-Committee further recalled that MSC 100 had endorsed an updated Roadmap, as set out in annex 2 to document MSC 100/WP.9, outlining, inter alia, the work to be undertaken by SDC 6 and SDC 7.

DRAFT GUIDELINES FOR NON-SOLAS VESSELS OPERATING IN POLAR WATERS

Safety measures for fishing vessels of 24 m length and above

8.5 The Sub-Committee had for its consideration document SDC 6/8 (Canada and New Zealand), providing draft Guidelines for safety measures for fishing vessels of 24 m length and above operating in polar waters, which followed a goal-based approach with close adherence to the provisions of the 2012 Cape Town Agreement.

Safety measures for pleasure yachts of 300 GT and above not engaged in trade

8.6 The Sub-Committee also had for its consideration documents SDC 6/8/1 (New Zealand), containing draft Guidelines for safety measures for pleasure yachts of 300 GT and above not engaged in trade operating in polar waters, and SDC 6/8/2 (FOEI et al.), supporting the two sets of draft guidelines as important future IMO instruments to address the risks of incidents and accidents involving fishing vessels and pleasure yachts in both Arctic and Antarctic waters.

Discussion

8.7 In the ensuing discussion, the following views were expressed:

General

.1 the development of safety measures for non-SOLAS ships that did not fall under the Polar Code regime was an important step towards the protection of the sensitive polar waters, which had already been adversely affected by climate change and the increase in marine traffic;

.2 the recent accident of a trawler in polar waters was a timely reminder of the need for the development of guidelines as it was an illustrative example of the challenges faced in polar regions, particularly with respect to the environmental damage caused by oil spills and the range limitations of SAR units to rescue persons;

.3 the work on the two sets of guidelines should commence by establishing an intersessional correspondence group which should prioritize the development of safety measures for fishing vessels;

Draft fishing vessel guidelines

.4 although fishing vessel safety was addressed in the 2012 Cape Town Agreement (2012 CTA), it had not yet entered into force and did not particularly address safety measures for the polar regions; therefore, there was a need for guidelines for fishing vessels operating in polar waters;

.5 the references to the 2012 CTA in the draft guidelines should be deleted since it was not in force and, where provisions of the 2012 CTA were relevant, such text should be copied directly into the draft guidelines;

.6 the reason for following the structure of the 2012 CTA in the guidelines was to avoid any future problems once it entered into force; however, as currently drafted, the guidelines resembled more a mandatory code;

.7 manning and survey requirements in the draft Guidelines for fishing vessels were inappropriate since manning provisions were derived from mandatory instruments while the survey provisions were for SOLAS ships, which was a matter for flag Administrations only;

Draft pleasure yachts guidelines

.8 the text recommending the applicability to smaller yachts of less than 300 GT should be deleted as it would be impracticable for such smaller yachts to meet the requirements of the current draft guidelines; and

.9 the current draft definition for "pleasure yachts not engaged in trade" required further consideration.

8.8 Having noted the wide support for the development of guidelines for both fishing vessels and pleasure yachts operating in polar waters, the Sub-Committee took the following decisions:

.1 Member States operating fishing vessels and which had not yet ratified the 2012 CTA were urged to do so as soon as possible; in this respect, the Sub-Committee commended the statement of the delegation of Spain that it had just ratified the Agreement and would be handing over the instrument of ratification to the Secretary-General on 7 February 2019;

.2 two sets of guidelines should be developed: one for fishing vessels and one for pleasure yachts; and

.3 a correspondence group should be established to develop the aforementioned guidelines.

ESTABLISHMENT OF A CORRESPONDENCE GROUP

8.9 The Sub-Committee established the Correspondence Group on Safety Measures for Non-SOLAS Ships Operating in Polar Waters, under the coordination of New Zealand,[5] and instructed it, taking into account comments and decisions taken at SDC 6, to:

.1 further develop the draft Guidelines for safety measures for fishing vessels of 24 metres and over operating in polar waters, based on the annex to document SDC 6/8, as a high priority with a view to finalization at SDC 7;

.2 further develop the draft Guidelines for pleasure yachts of 300 GT and above not engaged in trade operating in polar waters, based on the annex to document SDC 6/8/1; and

.3 submit a written report to SDC 7.

[5] **Coordinator:**
Mr. Craig Smith
PO Box 25620
Wellington, 6140
New Zealand
Tel: + 64 4 473 0111
Email: polar.code@maritimenz.govt.nz

9 UNIFIED INTERPRETATION TO PROVISIONS OF IMO SAFETY, SECURITY, AND ENVIRONMENT-RELATED CONVENTIONS

General

9.1 The Sub-Committee recalled that this was a continuous item on the biennial agenda and that the Assembly, at its twenty-eighth session, had expanded the output to include all proposed unified interpretations to provisions of IMO safety, security, and environment-related conventions, so that any newly developed or updated draft unified interpretation could be submitted for the consideration of the Sub-Committee, with a view to developing an appropriate IMO interpretation.

Unified interpretation of paragraph 3.4.2 of part B of the 2008 IS Code (MSC.1/Circ.1537)

9.2 The Sub-Committee considered document SDC 6/9 (IACS), proposing, as a short-term measure, to amend paragraph 3 of the *Unified interpretations of the 2008 IS Code* (MSC.1/Circ.1537) as practical experience had shown inconsistencies in the understanding of how the unified interpretation should be applied by flag Administrations.

9.3 After consideration, the Sub-Committee agreed to the revised unified interpretations of the 2008 IS Code and the associated draft MSC circular, as set out in annex 7, for submission to MSC 101 for approval with a view to dissemination as MSC.1/Circ.1537/Rev.1 (see also paragraph 9.18).

Doors in watertight bulkheads of cargo and passenger ships

9.4 The Sub-Committee considered document SDC 6/9/1 (IACS), informing that IACS had recently updated Unified Interpretation (UI) SC156 on "Doors in watertight bulkheads of cargo and passenger ships" and adopted Rev.1 of UI SC156 which required consequential amendments to the related provisions in MSC.1/Circ.1464 (*Unified interpretations of SOLAS chapters II-1 and XII, of the Technical provisions for means of access for inspections (resolution MSC.158(78)) and of the Performance standards for water level detectors on bulk carriers and single hold cargo ships other than bulk carriers (resolution MSC.188(79))*) and informing further that inconsistencies for requirements for doors in watertight bulkheads between SOLAS and other IMO instruments, including MARPOL, ICLL, and the IBC and IGC Codes were discovered during this work, which also needed to be addressed.

9.5 The Sub-Committee noted that IACS members would implement Rev.1 of UI SC 156 as follows, unless they were provided with written instructions to implement a different interpretation by the Administration on whose behalf they were authorized to act as a recognized organization:

.1 on ships contracted for construction on or after 1 January 2020;

.2 in the absence of a building contract, the keel of which is laid or which are at a similar stage of construction on or after 1 July 2020; or

.3 ships delivered on or after 1 January 2024.

9.6 In considering document SDC 6/9/1, the Sub-Committee noted the following views:

.1 following IACS' recently updated UI SC156, a revision of MSC.1/Circ.1464/Rev.1 could be generally supported;

.2 the current work undertaken by the Sub-Committee in respect to the "Review SOLAS chapter II-1, parts B-2 to B-4 to ensure consistency with parts B and B-1 with regard to watertight integrity" included doors in watertight bulkheads and that this work should be finalized first before embarking on a review of MSC.1/Circ.1464/Rev.1; and

.3 the proposal to remove the inconsistencies for requirements for doors in watertight bulkheads between SOLAS and other IMO instruments, including MARPOL, ICLL, and the IBC and IGC Codes, should be considered by the Sub-Committee.

9.7 Subsequently, the Sub-Committee agreed that, following IACS' recently updated UI SC156, consequential amendments to MSC.1/Circ.1464/Rev.1 were necessary but that the concrete actions to be taken would depend on the outcome of the SDS Working Group, which was instructed to review SOLAS chapter II-1, parts B-2 to B-4, to ensure consistency with parts B and B-1 with regard to watertight integrity, and any action to amend MSC.1/Circ.1464/Rev.1 would follow from thereon.

9.8 The Sub-Committee also agreed that the proposal to remove the inconsistencies for requirements for doors in watertight bulkheads between SOLAS and other IMO instruments, including MARPOL, ICLL, and the IBC and IGC Codes, while supported in general, would require consideration by the Committee in the form of a new output proposal.

9.9 Taking into account the above, the Sub-Committee invited Member States to liaise with IACS and to submit a proposal for a new output to MSC 101, addressing the inconsistencies for requirements for doors in watertight bulkheads in the aforementioned IMO instruments.

Instructions to the SDS Working Group

9.10 Following the above discussion, the Sub-Committee instructed the SDS Working Group, established under agenda item 4 (see paragraph 4.17), to revise MSC.1/Circ.1464/Rev.1, based on the proposal in document SDC 6/9/1.

Report of the SDS Working Group

9.11 In considering the relevant part of the report of the SDS Working Group (SDC 6/WP.5), the Sub-Committee noted that the Group, in reviewing MSC.1/Circ.1464/Rev.1, based on the proposal in document SDC 6/9/1, had identified that MSC.1/Circ.1464/Rev.1 and Corr.1 had been replaced by MSC.1/Circ.1572 for ships constructed on or after 9 June 2017, and that MSC.1/Circ.1464/Rev.1 (MSC.1/Circ.1572) only addressed SOLAS requirements, whereas document SDC 6/9/1 (IACS) also included other IMO instruments.

9.12 Subsequently, the Sub-Committee decided to instruct the SDS Correspondence Group to amend MSC.1/Circ.1572 only with respect to SOLAS requirements as amended up to resolution MSC.421(98) (see paragraph 4.23.3).

Proposed amendments to MSC.1/Circ.1535, MSC.1/Circ.1537 and MSC.1/Circ.1539

9.13 The Sub-Committee considered document SDC 6/9/2 (United States), proposing amendments to the unified interpretations in MSC.1/Circ.1535, MSC.1/Circ.1537 and MSC.1/Circ.1539 to include provisions on openings to ventilation systems for closed ro-ro and vehicle spaces that must run continuously whenever vehicles were on board.

9.14 One delegation sought clarification on whether the proposed amendments to the unified interpretation in MSC.1/Circ.1535/Corr.1, proposing to consider closed ro-ro vehicle space vent openings as unprotected openings (downflooding points) in stability evaluations, took into account existing provisions in the IMDG Code on ventilation requirements for cargo spaces carrying dangerous goods.

9.15 The observer of IACS, in response to the possible application of the proposal to existing ships, highlighted that the unified interpretations in MSC.1/Circ.1535, MSC.1/Circ.1537 and MSC.1/Circ.1539 were, by definition, recommendations of the Organization. In this regard it was noted that, unless they were advised otherwise by Administrations, IACS members would apply such amended IACS UIs to "new ships".

9.16 The Sub-Committee discussed a proposal whereby "…supply air to the engine-room or emergency generator room or closed ro-ro and vehicle spaces" would be collectively referred to as "spaces"; however, concerns were raised that such modification could be misconstrued in that all ventilators could be considered as unprotected openings for damage stability calculations.

9.17 Recalling the support for the initially proposed text in document SDC 6/9, the Sub-Committee agreed to forward the proposals therein to the Committee for approval, recognizing that further modifications might be submitted to refine the proposal, taking into account the general intent as outlined in paragraph 9.14 above.

9.18 Subsequently, the Sub-Committee agreed to the revisions to the unified interpretations disseminated by MSC.1/Circ.1537, MSC.1/Circ.1535 and MSC.1/Circ.1539 and the associated draft revised MSC circulars, as set out in annexes 7, 8 and 9, respectively, for approval by MSC 101, for dissemination as MSC.1/Circ.1535/Rev.1, MSC.1/Circ.1537/Rev.1 and MSC.1/Circ.1539/Rev.1 (see also paragraph 9.3).

Unified interpretation of SOLAS regulations II-1/22-1 and II-2/21.4.13 regarding safe return to port requirements for flooding detection systems

9.19 The Sub-Committee had for its consideration document SDC 6/9/3 (IACS), proposing a draft unified interpretation of SOLAS regulations II-1/22-1 and II-2/21.4.13 for ships contracted for construction on or after 1 July 2019, which took into account the outcome of SDC 5 on the matter.

9.20 The observer from CLIA, in expressing support for document SDC 6/9/3, pointed out that passenger ships built after 1 July 2010 which had liquid level indicators fitted inside ballast water tanks or similar tanks met the requirements for safe return to port; and that CLIA members' ships were already either fitted with a combination of flooding sensors and tank gauging providing redundancy for the safe return to port requirements or had fully redundant flooding detection sensors and systems providing for safe return to port.

9.21 The Sub-Committee supported the proposal for a draft unified interpretation of SOLAS regulations II-1/22-1 and II-2/21.4.13 regarding safe return to port requirements for flooding detection systems and agreed to the draft MSC circular on unified interpretation of SOLAS chapter II-2, as set out in annex 10, for submission to MSC 101 for approval.

IACS UI SC123 machinery installations – service tank arrangements

9.22 The Sub-Committee considered document SDC 6/9/4 (IACS), providing the latest version of IACS UI SC123, which had been developed in light of typical fuel oil service tank arrangements for vessels trading in Emission Control Areas (ECAs) that used both low-sulphur distillate and residual grade fuel oils, so as to facilitate the consistent and global implementation of SOLAS regulation II-1/26.11.

9.23 While some delegations supported the draft unified interpretation, in principle, others expressed concerns in regard to the provision requiring an emergency fuel changeover within one hour, which was neither recommended by manufacturers nor considered to be safe when carried out on board.

9.24 Following discussion, the Sub-Committee agreed that this matter required further consideration and forwarded document SDC 6/9/4 to MSC 101, for consideration under the Committee's agenda item on "Development of further measures to enhance the safety of ships relating to the use of fuel oil".

10 BIENNIAL STATUS REPORT AND PROVISIONAL AGENDA FOR SDC 7

Biennial status report and proposed biennial agenda for the 2020-2021 biennium

10.1 Taking into account the progress made at the session, the Sub-Committee prepared the biennial status report (SDC 6/WP.2, annex 1) and the proposed biennial agenda for the 2020-2021 biennium (SDC 6/WP.2, annex 2), as set out in annexes 11 and 12, respectively, for consideration by MSC 101.

10.2 The Sub-Committee noted a proposal by the Chair to consider the following outputs that had been on the post-biennial agenda of the Committee since MSC 76 (outputs 7 and 8) and MSC 91 (output 32), respectively, for which a decision should be made as to how to progress the work:

.1 Mandatory application of the performance standard for protective coatings for void spaces on bulk carriers and oil tankers (OW 7);

.2 Performance standard for protective coatings for void spaces on all types of ships (OW 8); and

.3 Recommendations related to navigational sonar on crude oil tankers (OW 32).

10.3 In considering the three outputs, the Sub-Committee agreed to include OW 7 and OW 8 in the provisional agenda of SDC 7. In considering output OW 32, the Sub-Committee recalled that, following an FSA study (MEPC 58/17/2 and MEPC 58/INF.2), MSC 91 had instructed the former Sub-Committee on Ship Design and Equipment (DE) to further consider risk control option six on navigational sonar, taking into account the view that navigational sonar might be a source of underwater noise (MSC 91/22, paragraph 16.15.3).

10.4 The Sub-Committee also recalled that MSC 91 had agreed to include in the post-biennial agenda of the Committee, an output on "Recommendations related to navigational sonar on crude oil tankers", with one session needed to complete the item, assigning the DE Sub-Committee as the coordinating organ (MSC 91/22, paragraph 19.23).

10.5 Following discussion, the Sub-Committee agreed to seek advice and a decision from the Committee on its conclusion since consideration of navigational sonars on crude oil tankers was not an item under the remit of this Sub-Committee and recalling that a similar conclusion had been reached at NCSR 6 when considering an output related to echo-sounders to have a forward-looking capability in relation to consequential work related to the new Polar Code. Therefore, the Sub-Committee agreed to recommend that this output be deleted and invited the Committee to consider the above recommendation and take action as appropriate.

Proposed provisional agenda for SDC 7

10.6 Taking into account the progress made at the session, the Sub-Committee prepared the proposed provisional agenda for SDC 7 (SDC 6/WP.2, annex 2), as set out in annex 13, for consideration by MSC 101.

Correspondence groups established at the session

10.7 The Sub-Committee confirmed the establishment of Correspondence Groups on the following subjects, due to report to SDC 7:

.1 amendments to the Explanatory Notes to SOLAS chapter II-1 subdivision and damage stability regulations (resolution MSC.429(98)) (paragraph 4.23);

.2 finalization of second generation intact stability criteria (paragraph 5.23);

.3 carriage of more than 12 industrial personnel on board vessels engaged on international voyages (paragraph 6.29); and

.4 safety measures for non-SOLAS ships operating in polar waters (paragraph 8.9).

Arrangements for the next session

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

.1 amendments to the Explanatory Notes to SOLAS chapter II-1 subdivision and damage stability regulations (resolution MSC.429(98));

.2 finalization of second generation intact stability criteria;

.3 carriage of more than 12 industrial personnel on board vessels engaged on international voyages; and

.4 safety measures for non-SOLAS ships operating in polar waters,

whereby the Chairman, taking into account the submissions received on the respective subjects, would advise the Sub-Committee before SDC 7 on the final selection of such groups.

Date of the next session

10.9 The Sub-Committee noted that its seventh session had been tentatively scheduled to take place from 3 to 7 February 2020.

11 ELECTION OF CHAIR AND VICE-CHAIR FOR 2020

In accordance with the Rules of Procedure of the Maritime Safety Committee, the Sub-Committee unanimously re-elected Mr. K. Hunter (United Kingdom) as Chair and Ms. T. Stemre (Norway) as Vice-Chair, both for 2020.

12 ANY OTHER BUSINESS

Corrections to the Guidelines for wing-in-ground (WIG) craft (MSC.1/Circ.1592)

12.1 The Sub-Committee considered document SDC 6/12 (Secretariat), proposing to update outdated references in the *Guidelines for wing-in-ground (WIG) craft* (MSC.1/Circ.1592), in particular, references to SOLAS regulations III/42 and III/44.

12.2 Having considered the above document, the Sub-Committee agreed to revisions to the *Guidelines for wing-in-ground (WIG) craft* (MSC.1/Circ.1592) and the associated draft MSC circular, as set out in annex 14, for submission to MSC 101 for approval with a view to dissemination as MSC.1/Circ.1592/Rev.1.

Review of systems required to remain operational in a casualty and methods of energy distribution for those systems

12.3 The Sub-Committee had for its consideration document SDC 6/12/1 (CESA), proposing to initiate a holistic and detailed review of SOLAS chapters II-1 and II-2, in particular the provisions and definitions related to main and emergency energy, as well as safe return to port power, with a view to identifying ambiguities and limitations to improve ships' safety using new power supply concepts.

12.4 A view was expressed that existing regulations already facilitated power distribution arrangements on board ships and, therefore, there was no need to review relevant provisions; and the proposal to require emergency energy supply to meet the goal of limiting GHG emissions was not acceptable as safety of life at sea takes priority, especially in an emergency where GHG emission considerations should not prevail.

12.5 Subsequently, the Sub-Committee invited interested Member States and international organizations to liaise with CESA to develop a new output proposal in accordance with the Committees' method of work.

Outcome of technical seminars on the 2012 Cape Town Agreement held in the Philippines and Indonesia

12.6 The Sub-Committee noted with appreciation the information contained in document SDC 6/INF.6 (Indonesia et al.), providing information on two technical seminars on the 2012 Cape Town Agreement, co-hosted by IMO, Pew and the Maritime Industry Authority of the Philippines, held in Manila, Philippines, from 24 to 26 October 2018, and the Coordinating Ministry of Maritime Affairs of Indonesia, held in Bali, Indonesia, from 31 October to 2 November 2018.

Review of IMO Model Course 3.07 on Hull and Structural Surveys

12.7 The Sub-Committee recalled that MSC 100 had instructed it to consider whether model courses under its responsibility might need to be revised and, if that was the case, to do so in accordance with the *Revised guidelines for the development, review and validation of model courses* (MSC-MEPC.2/Circ.15/Rev.1) at the earliest opportunity, in consultation with the Secretariat, in order to streamline the process.

12.8 The Sub-Committee also recalled that the review of IMO model courses followed a categorization, in accordance with paragraph 3.2 of MSC-MEPC.2/Circ.15/Rev.1, and that Model Course 3.07 on Hull and Structural Surveys might be assigned as category 2, based on the assessment of the Chair and the Secretariat who considered significant changes that had occurred since 2004, including amendments to relevant IMO instruments and technological changes since the course was last published.

12.9 The Sub-Committee invited interested Member States and international organizations to volunteer to become a course developer for the review of IMO Model Course 3.07 on Hull and Structural Surveys.

12.10 In the absence of any volunteers at this session, the Sub-Committee invited interested delegations who wished to review Model Course 3.07 as course developer to contact the Secretariat by email (sdc@imo.org).

New GISIS functionality for nomination of GBS auditors

12.11 The Sub-Committee recalled that MSC 100 had considered a proposal by the Secretariat to develop a GISIS functionality under the existing module "National Contacts" to allow Member States and international organizations to nominate GBS auditors directly in GISIS and to update the list of auditors, as necessary.

12.12 The Sub-Committee also recalled that MSC 100, having noted that this GISIS functionality would:

.1 reduce the administrative burden for nominating Member States, international organizations and the Secretariat;

.2 increase transparency as the information would be available to all GISIS users; and

.3 build upon the existing GISIS structure, thereby not incurring additional costs to the Organization,

had agreed to its development and requested the Secretariat to take the necessary action, and provide an update on the progress made to MSC 101.

12.13 Following a presentation on the new functionality, the Sub-Committee noted the effort of the Secretariat in developing this new GISIS functionality and requested Member States and international organizations to use it for the nomination of GBS auditors, after it became operational at MSC 101.

12.14 In this connection, the Sub-Committee noted information provided by the Secretariat regarding difficulties experienced when establishing GBS Audit Teams as a number of auditors nominated by Member States and international organizations were no longer available for a variety of reasons, thereby reducing the pool of auditors for future verification audits. Subsequently, the Sub-Committee encouraged delegations to submit nominations in accordance with Circular Letter No.3076 or, once it was operational, the new GISIS function.

Draft interim guidelines for the safety of ships using methyl/ethyl alcohol as fuel

12.15 The Sub-Committee recalled that MSC 100 had endorsed the referral of relevant parts of the draft interim guidelines for the safety of ships using methyl/ethyl alcohol as fuel to CCC 6 for consideration and advice, as set out in annex 1 to document CCC 5/13.

12.16 The Sub-Committee also recalled that it had been specifically requested to provide advice on draft paragraph 5.3.3 in annex 1 to document CCC 5/13 so as to review the limit for the safe location of fuel tank(s) which reads:

> "5.3.3 The fuel containment system should be abaft of the collision bulkhead and forward of the aft peak bulkhead."

12.17 After considering the matter, the Sub-Committee agreed to the above draft text without further comments and requested the Secretariat to inform CCC 6 accordingly.

Expressions of appreciation

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

- Mr. Joseph J. Angelo (INTERTANKO) (on retirement)
- Mr. Erick Anwandter (Chile) (on new duties)
- Mr. Aubrey Botsford (IMO Secretariat) (on retirement)
- Dr Stefan Micallef (IMO Secretariat) (on retirement)
- Mr. Greg Shark (IACS) (on retirement)
- Ms. Julissa Macchiavello (Peru) (on new duties)

13 ACTION REQUESTED OF THE COMMITTEE

13.1 The Maritime Safety Committee, at its 101st session, is invited to:

.1 approve draft amendments to SOLAS regulation II-1/3-8 with a view to subsequent adoption, taking into account the check/monitoring sheet and records for regulatory development prepared by the Sub-Committee (paragraph 3.17 and annex 1);

.2 approve, in principle, the draft MSC circular on Guidelines on the design of mooring arrangements and the selection of appropriate mooring equipment and fittings for safe mooring, with a view to final approval in conjunction with the adoption of the draft amendments to SOLAS regulation II-1/3-8 (paragraph 3.18 and annex 2);

.3 approve, in principle, the draft MSC circular on Guidelines for inspection and maintenance of mooring equipment including lines, with a view to final approval in conjunction with the adoption of the draft amendments to SOLAS regulation II-1/3-8 (paragraph 3.19 and annex 3);

.4 consider whether familiarization training on mooring equipment and fittings should be developed for shore-based mooring personnel, taking into account the *Guidelines on minimum training and education for mooring personnel* (FAL.6/Circ.11/Rev.1) (paragraphs 3.20 and 3.21);

.5 approve, in principle, the revised Guidance on shipboard towing and mooring equipment (MSC.1/Circ.1175) and the associated draft revised MSC circular, to be disseminated as MSC.1/Circ.1175/Rev.1, with a view to final approval in conjunction with the adoption of the draft amendments to SOLAS regulation II-1/3-8 (paragraph 3.22 and annex 4);

.6 endorse the approach taken to solve the inconsistencies with respect to watertight integrity between parts B-2 to B-4 in SOLAS chapter II-1 and approve the draft amendments to SOLAS regulation II-1/7-2.5 (part B-1) (paragraphs 4.8 and 4.19 and annex 5);

.7 approve, subject to the decision in sub-paragraph .6 above, the draft amendments to parts B-1 to B-4 of SOLAS chapter II-1 with a view to subsequent adoption**,** taking into account the check/monitoring sheet and records for regulatory development prepared by the Sub-Committee (paragraph 4.20 and annex 5);

.8 note the progress made in the development of the second generation intact stability criteria and that a consolidated single set of guidelines for all five stability failure modes is expected to be finalized at SDC 7 (paragraphs 5.20 to 5.23);

.9 consider the confusion, ambiguity and differing interpretations among delegations on the use of an aggregated number of passengers, special personnel and industrial personnel to invoke the application of the IP Code and decide whether the use of an aggregated number (MSC 99/22, paragraph 10.17.1) should be maintained for the application of SOLAS chapter XV and the draft IP Code (paragraphs 6.8 to 6.12);

.10 note that input and advice has been requested from the CCC and PPR Sub-Committees in relation to the provisions in the draft IP Code on the carriage of dangerous goods (paragraphs 6.24 to 6.28);

.11 approve the draft International Code on the Enhanced Programme of Inspections during Surveys of Bulk Carriers and Oil Tankers, 2019 (2019 ESP Code) and the associated draft Assembly resolution, for submission to the Assembly for consideration with a view to adoption (paragraph 7.14 and annex 6);[6]

.12 approve the revised Unified interpretations of the 2008 IS Code (MSC.1/Circ.1537) and the associated draft MSC circular, for dissemination as MSC.1/Circ.1537/Rev.1 (paragraphs 9.3 and 9.18 and annex 7);

6 Refer to document SDC 6/13/Add.1.

.13 approve the revised Unified interpretations relating to the Protocol of 1988 relating to the International Convention on Load Lines, 1966 (MSC.1/Circ.1535) and the associated draft MSC circular, for dissemination as MSC.1/Circ.1535/Rev.1 (paragraphs 9.18 and annex 8);

.14 approve the revised Unified interpretations of SOLAS chapter II-1 (MSC.1/Circ.1539) and the associated draft MSC circular, for dissemination as MSC.1/Circ.1539/Rev.1 (paragraph 9.18 and annex 9);

.15 approve Unified interpretation of SOLAS regulations II-1 regarding safe return to port requirements for flooding detection systems (paragraph 9.21 and annex 10);

.16 consider the discussions on the proposed unified interpretation on service tank arrangements and the recommendation to consider document SDC 6/9/4 under the new agenda item on "Development of further measures to enhance the safety of ships relating to the use of fuel oil" (paragraphs 9.22 to 9.24);

.17 approve the biennial status report of the Sub-Committee (paragraph 10.1 and annex 11);

.18 consider the proposed biennial agenda of the Sub-Committee for the 2020-2021 biennium and take action, as appropriate (paragraph 10.1 and annex 12);

.19 consider the recommendation to delete the output on "Recommendations related to navigational sonar on crude oil tankers" and take action as appropriate (paragraphs 10.2 to 10.5);

.20 approve the proposed provisional agenda for SDC 7 (paragraph 10.6 and annex 13);

.21 approve the revised Guidelines for wing-in-ground craft (MSC.1/Circ.1592) and the associated draft MSC circular, for dissemination as MSC.1/Circ.1592/Rev.1 (paragraph 12.2 and annex 14);

.22 note the consideration of the Sub-Committee regarding the review of Model Course 3.07 on Hull and Structural Survey (paragraphs 12.7 to 12.10);

.23 note that the Sub-Committee has forwarded its views on the relevant parts of the draft interim guidelines for the safety of ships using methyl/ethyl alcohol as fuel to CCC 6 for consideration and action as appropriate (paragraph 12.17); and

.24 approve the report in general.

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ANNEX 1[1]

DRAFT AMENDMENTS TO SOLAS REGULATION II-1/3-8

The existing regulation 3-8 is replaced with the following:

"**Towing and mooring equipment**

1 Paragraphs 4 to 6 of this regulation apply to ships constructed on or after 1 January 2007.

2 Paragraphs 7 and 8 of this regulation only apply to ships:

.1 for which the building contract is placed on or after [date of entry into force]; or

.2 in the absence of a building contract, the keel of which is laid or which is at a similar stage of construction on or after [date of entry into force plus six months]; or

.3 the delivery of which is on or after [date of entry into force plus three years].

~~1~~3 This regulation ~~applies to ships constructed on or after 1 January 2007, but~~ does not apply to ~~emergency~~ towing arrangements provided in accordance with regulation 3-4.

~~2~~4 Ships shall be provided with arrangements, equipment and fittings of sufficient safe working load to enable the safe conduct of all towing and mooring operations associated with the normal operation of the ship.

~~3~~5 Arrangements, equipment and fittings provided in accordance with paragraph ~~2~~4 above shall meet the appropriate requirements of the Administration or an organization recognized by the Administration under regulation I/6.*

~~4~~6 Each fitting or item of equipment provided under this regulation shall be clearly marked with any ~~restrictions~~ limitation associated with its safe operation, taking into account the strength of ~~its attachment to~~ the supporting ship's structure and its attachment to it.

7 For ships of 3,000 gross tonnage and above, the mooring arrangement shall be designed, and the mooring equipment including lines shall be selected, in order to ensure occupational safety and safe mooring of the ship, based on the guidelines developed by the Organization.† Ship-specific information shall be provided and kept on board.‡

8 Ships of less than 3,000 gross tonnage should comply with the requirement in paragraph 7 above as far as reasonably practicable, or with applicable national standards of the Administration.

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1 Amended text shown in tracked changes using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.

9 For all ships, mooring equipment including lines shall be inspected and maintained in suitable condition for their intended purposes.[§]

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[*] Refer to the *Guidance on shipboard towing and mooring equipment* (MSC.1/Circ.1175) for ships constructed on or after 1 January 2007 but before [date of entry into force] and the *Guidance on shipboard towing and mooring equipment* (MSC.1/Circ.1175/Rev.1) for the ships constructed on or after [date of entry into force].

[†] Refer to the *Guidelines on the design of mooring arrangements and the selection of appropriate mooring equipment and fittings for safe mooring* (MSC.1/Circ.[…]).

[‡] Refer to *Towing and mooring arrangement plan* (MSC.1/Circ.[…] *N.B. insert reference to Guidelines on the design of mooring arrangements and the selection of appropriate mooring equipment and fittings for safe mooring).*

[§] [Refer to the *Guidelines for inspection and maintenance of mooring equipment including lines* (MSC.1/Circ.[…]).

APPENDIX

CHECK/MONITORING SHEET FOR THE DRAFT SOLAS AMENDMENTS (MSC.1/CIRC.1500/REV.1)

Part III – Process monitoring to be completed during the work process at the sub-committee and checked as part of the final approval process by the Committee (refer to paragraph 3.2.1.3)[**]

1	The sub-committee, at an initial engagement, has allocated sufficient time for technical research and discussion before the target completion date, especially on issues needing to be addressed by more than one sub-committee and for which the timing of relevant sub-committees' meetings and exchanges of the result of consideration needed to be carefully examined.	yes
2	The scope of application agreed at the proposal stage was not changed without the approval of the Committee.	yes
3	The technical base document/draft amendment addresses the proposal's issue(s) through the suggested instrument(s); where it does not, the sub-committee offers the Committee an alternative method of addressing the problem raised by the proposal.	n/a
4	Due attention has been paid to the *Interim guidelines for the systematic application of the grandfather clauses* (MSC/Circ.765-MEPC/Circ.315).	yes
5	All references have been examined against the text that will be valid if the proposed amendment enters into force.	yes
6	The location of the insertion or modified text is correct for the text that will be valid when the proposed text enters into force on a four-year cycle of entry into force, as other relevant amendments adopted might enter into force on the same date.	yes
7	There are no inconsistencies in respect of scope of application between the technical regulation and the application statement contained in regulation 1 or 2 of the relevant chapter, and application is specifically addressed for existing and/or new ships, as necessary.	yes
8	Where a new term has been introduced into a regulation and a clear definition is necessary, the definition is given in the article of the Convention or at the beginning of the chapter.	yes
9	Where any of the terms "fitted", "provided", "installed" or "installation" are used, consideration has been given to clarifying the intended meaning of the term.	yes

** Part III should be completed by the drafting/working group that prepared the draft text using "yes", "no" or "not applicable". For the draft amendments to be considered and finalized by sub-committees in plenary within one session, the Secretariat may be requested, when necessary, to complete part III of the check/monitoring sheet after the session, instead of establishing a specific working/drafting group. "Minor corrections" (C/ES.27/D, paragraph 3.2(vi)) may be excluded from application of the provisions for completion of the check/monitoring sheet.

10	All necessary related and consequential amendments to other existing instruments, including non-mandatory instruments, in particular to the forms of certificates and records of equipment required in the instrument being amended, have been examined and included as part of the proposed amendment(s).	n/a
11	The forms of certificates and records of equipment have been harmonized, where appropriate, between the Convention and its Protocols.	n/a
12	It is confirmed that the amendment is being made to a currently valid text and that no other bodies are concurrently proposing changes to the same text.	yes
13	All entry-into-force criteria (building contract, keel laying and delivery) have been considered and addressed.	yes
14	Other impacts of the implementation of the proposed/approved amendment have been fully analysed, including consequential amendments to the "application" and "definition" regulations of the chapter.	yes
15	The amendments presented for adoption clearly indicate changes made with respect to the original text, so as to facilitate their consideration.	yes
16	For amendments to mandatory instruments, the relationship between the Convention and the related instrument has been observed and addressed, as appropriate.	yes
17	The related record format has been completed or updated, as appropriate.	yes

RECORD FORMAT ‡‡

(MSC.1/Circ.1500/Rev.1, annex 3)

The following records should be created and kept updated for each regulatory development.*

The records can be completed by providing references to paragraphs of related documents containing the relevant information, proposals, discussions and decisions.

1	**Title (number and title of regulation(s))**
SOLAS Regulation II-1/3-8 "Towing and mooring equipment".	
2	**Origin of the requirement (original proposal document)**
MSC 95/19/2 (Austria et al.), MSC 95/INF.3 (Denmark) and MSC 95/19/13 (Japan).	
3	**Main reason for the development (extract from the proposal document)**
Mooring operations are one of the most common operations performed by ships' crews. It is also one of the work situations where crew members are exposed to excessive dynamic forces, detrimental heavy manual work processes and the influence of unfavourable weather conditions that may further hamper the safe and healthy accomplishment of the involved port call. Accidents are frequent and each year these operations involve a number of fatalities. By way of example, in the period from 1997 to 2013, 402 accidents have been registered on Danish ships leading to 4 fatalities and 43 injuries.	
4	**Related output**
Revised SOLAS regulation II-1/3-8 and associated guidelines (MSC.1/Circ.1175) and new guidelines for safe mooring operations for all ships.	
5	**History of the discussion (approval of work programmes, sessions of sub-committees, including CG/DG/WG arrangements)**
MSC 95 (2015 June), following consideration of the above-mentioned documents, agreed to include in the 2016-2017 biennial agenda of the SDC Sub-Committee and the provisional agenda for SDC 3, a new output. SDC 3 (2016 January), under agenda item 15, established a Drafting Group and a Correspondence Group. SDC 4 (2017 February), under agenda item 11, re-established the Correspondence Group. SDC 5 (2018 January), under agenda item 10, established a Working Group and re-established the Correspondence Group. SDC 6 (2019 February), under agenda item 3, established a Working Group and prepared the draft amendment to SOLAS regulation II-1/3-8 and associated draft MSC circulars.	

‡‡ Paragraph 3.2.1.3 of annex 3 to MSC.1/Circ.1500/Rev.1 states that the record format to be completed in the module "Development of amendments to the 1974 SOLAS Convention and related mandatory instruments" of GISIS by the drafting or working group that prepares the draft amendment(s).

* For the draft amendments to be considered and finalized by sub-committees in plenary within one session, the Secretariat may be requested, when necessary, to complete the records for regulatory development after the session, instead of establishing a specific working/drafting group. "Minor corrections" (C/ES.27/D, paragraph 3.2(vi)) may be excluded from application of the provisions for completion of the records for regulatory development.

6	**Impact on other instruments (codes, performance standards, guidance circulars, certificates/records format, etc.)**
Survey Guidelines under the Harmonized System of Survey and. Certification (HSSC), 2017 List of certificates and documents required to be carried on board ships, 2017 (FAL.2/Circ.131-MEPC.1/Circ.873-MSC.1/Circ.1586)	
7	**Technical background**
7.1	***Scope and objective (to cross check with items 4 and 5 in part II of the checklist)***
The proposed amended regulation should involve all new ships with a gross tonnage on or above 3,000 covered by the existing SOLAS chapter II-1. New ships with a gross tonnage below 3,000 should, regarding all operational areas that may be defined in the proposed guidelines, comply with those to the extent practicable (MSC 95/19/2, paragraph 36).	
7.2	***Technical/operational background and rationale (e.g. summary of FSA study, if available, or engineering challenge posed)***
See paragraph 3 above.	
7.3	***Source/derivation of requirement (non-mandatory instrument, industry standard, national/regional requirement)***
The existing SOLAS regulation II-1/3-8.	
7.4	***Short summary of requirement (what is the new requirement – in short and lay terms)***
The revised SOLAS regulation requires that: .1 for ships of 3,000 gross tonnage and above, the mooring arrangement shall be designed, and the mooring equipment including lines shall be selected, in order to ensure occupational safety and safe mooring of the ship, based on the guidelines developed by the Organization (guidelines on the design of mooring arrangements and the selection of appropriate mooring equipment and fittings for safe mooring); .2 ships of less than 3,000 gross tonnage should comply with the aforementioned requirement as far as reasonably practicable, or with applicable national standards of the Administration; and .3 for all ships, mooring equipment including lines shall be inspected and maintained in suitable condition for their intended purposes.	
7.5	***Points of discussions (controversial points and conclusion)***
N/A.	

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ANNEX 2

DRAFT MSC CIRCULAR

GUIDELINES ON THE DESIGN OF MOORING ARRANGEMENTS AND THE SELECTION OF APPROPRIATE MOORING EQUIPMENT AND FITTINGS FOR SAFE MOORING

1 The Maritime Safety Committee, at its [101st session (5 to 14 June 2019)], having considered a proposal by the Sub-Committee on Ship Design and Construction, at its sixth session (4 to 8 February 2019), and recognizing the importance of design of mooring arrangements and the selection of appropriate mooring equipment and fittings for safe mooring operations, with a view to ensuring a uniform approach towards the application of the provisions of SOLAS regulation II 1/3-8, as amended by resolution MSC.[….(…)}, which is expected to become effective on [*date of entry into force*], approved the *Guidelines on the design of mooring arrangements and the selection of appropriate mooring equipment and fittings for safe mooring*, as set out in the annex.

2 Member States are invited to bring the annexed Guidelines to the attention of ship designers, shipyards, shipowners, ship managers, bareboat charterers and other organizations or persons responsible for design of mooring arrangements and the selection of appropriate mooring equipment and fittings.

3 Member States are also invited to bring the annexed Guidelines to the attention of shipmasters, ships' officers and crew and all other parties concerned.

ANNEX

GUIDELINES ON THE DESIGN OF MOORING ARRANGEMENTS AND THE SELECTION OF APPROPRIATE MOORING EQUIPMENT AND FITTINGS FOR SAFE MOORING

1 Introduction

1.1 Historical evolution in ship designs, especially the design of large ships, have resulted in optimized performance and a greater degree of complexity; this has not been extended to the design of ships' mooring arrangements. These Guidelines support the application of the provisions of SOLAS for mooring arrangements and encourage greater consideration of the occupational safety and safe mooring of the ship when designing new ships. Improving the design of mooring arrangements should enhance usability and safety during towing and mooring operations.

1.2 Regulations II-1/3-8.7 and II-1/3-8.8 of the International Convention for the Safety of Life at Sea (SOLAS), as amended, require that for ships of 3,000 gross tonnage and above constructed on or after [1 January 2024], the mooring arrangement shall be designed, and the mooring equipment including lines shall be selected, in order to ensure occupational safety and safe mooring of the ship; and ships of less than 3,000 gross tonnage constructed on or after [1 January 2024] should comply with these requirements as far as reasonably practicable, or with applicable national standards of the Administration.

1.3 These Guidelines provide an approach to the design of mooring arrangements, and the selection of mooring equipment and fittings, which should be applied in conjunction with principles of ergonomics and usability.

2 Definitions

For the purposes of these Guidelines:

2.1 *Line Design Break Force (LDBF)* means the minimum force that a new, dry, spliced, mooring line will break at. This is for all synthetic cordage materials.

2.2 *Mooring area* refers to the dedicated area on a ship where mooring equipment is installed and line-handling takes place. It also includes areas where there is a risk of personnel injury in event of snap-back or other failure of mooring equipment. There may be multiple mooring areas on a ship.

2.3 *Mooring arrangements* means the configuration of the mooring equipment and fittings and other design features of the ships related to the mooring operation, i.e. lighting and communication equipment.

2.4 *Mooring equipment and fittings* means items such as mooring winches, capstans, bollards, bitts, fairleads, rollers, chocks, etc. and also includes mooring lines.

2.5 *Mooring lines* means ropes, wires and combinations used for mooring operations other than messenger lines but including tails.

2.6 *Mooring operations* means normal mooring and unmooring of the ship, including associated in-harbour towing movements.

2.7 *Mooring personnel* means personnel tasked to assist in the activity of mooring and unmooring ships, either ashore or from mooring boats, carried out within the framework of port marine services.

2.8 *Shipboard personnel* means personnel assigned duties for supervising or working in mooring areas during mooring operations.

2.9 *Ship Design Minimum Breaking Load (MBL_{SD})* means the minimum breaking load of new, dry, mooring lines for which shipboard fittings and supporting hull structures are designed in order to meet mooring restraint requirements.

2.10 *Supervising personnel* means shipboard personnel assigned duties for supervising mooring areas during mooring operations.

2.11 *Towing and mooring arrangements plan* means the plan as described in section 5 of the annex to the *Revised guidance on shipboard towing and mooring equipment* (MSC.1/Circ.1175/Rev.1) ("Revised guidance"). This plan presents specific information regarding the towing and mooring fittings aboard the vessel, the mooring lines, as well as the arrangement of mooring lines and the acceptable environmental conditions for mooring.

2.12 *Working Load Limit (WLL)* means the maximum load that a mooring line should be subjected to in operational service, calculated from the relevant environmental mooring restraint requirement.

3 Goals

The equipment selection and mooring arrangement design safety objectives should be to facilitate safe mooring operations and reduce the risk to shipboard personnel and mooring personnel caused by inappropriate selection and arrangement of equipment and fittings.

4 Functional objectives

4.1 A ship should be provided with mooring equipment and fittings appropriate for its type and size. In addition, a ship should be provided with mooring lines appropriate for the equipment and fittings installed on board. In order to achieve the goals for the correct equipment selection and mooring arrangement design safety objectives set out in section 3, the following functional objectives should be applied.

4.2 Mooring equipment and fittings should be:

.1 arranged to minimize obstructed access to and operation of the mooring equipment;

.2 arranged to minimize obstructed access to working space, and minimize obstructed view of the mooring area;

.3 arranged to minimize the need for complex mooring line configurations during the normal operation of the ship;

.4 selected and arranged to minimize the need for manual handling of mooring lines under load; and

.5 selected and arranged to minimize the exposure of personnel involved in mooring operations to the dynamic loads of mooring lines.

5 Achievement of the functional objectives

To meet the functional objectives, the following design and equipment features should be considered from the earliest stage in the design process.

Selection of equipment, fittings and mooring lines should not be undertaken independently. To facilitate safe mooring operations, it is necessary for mooring equipment, fittings and mooring lines to be considered as a complete system within which all components are compatible.

The guidance on the design of mooring arrangements and the selection of equipment and fittings should be read in conjunction with the [*Revised] guidance on shipboard towing and mooring equipment* (MSC.1/Circ.1175/Rev.1).

This section should be implemented to the extent permitted by the size and purpose of the ship.

5.1 Design of mooring arrangements

5.1.1 To minimize the need for complex mooring line configurations during the normal operation of the ship, mooring winches and fairleads should be positioned to allow the use of direct, unobstructed leads from the mooring winch to the fairlead for each of the mooring lines described in the towing and mooring arrangements plan. It is preferable to provide a dedicated fairlead for each mooring line.

5.1.2 Where a straight lead is not possible:

.1 the deviation from a straight lead should be by means of pedestal fairleads, rolling fairleads or similar means that will reduce friction between line/fitting and reduce bend losses. Steel fittings such as horns or bollards without chafe protection should be avoided;

.2 the line should traverse the mooring area from winch to the fairlead by the shortest route; and

.3 changes of direction of mooring line should be minimized to prevent reductions in mooring line strength due to bend loss and introduction of complex snap-back areas.

5.1.3 To provide for the oversight and supervision of the mooring operations, the mooring area should be designed to give supervising personnel an unobstructed view of the installed mooring equipment and fittings. This should include the provision for a platform, or other appropriate means, by which supervising personnel can obtain an unobstructed view of the mooring area and berth arrangements planned to be used from a position clear of hazards.

5.1.4 The mooring arrangements should be designed to provide unobstructed views between shipboard personnel, and of lines being worked, within the mooring area.

5.1.5 The winch operator should be provided with mooring winch controls that are positioned so that the winch operator has a direct view of the line in the mooring area being worked without stepping away from the winch controls. Winch controls should be positioned clear of hazards.

5.1.6 Deck illumination should provide a clear view of the mooring area and the equipment and lines being worked during hours of darkness or in conditions of limited visibility.

5.1.7 The design of mooring arrangements and mooring areas should take into account the following constraints:

.1 anticipated variations in shore-based mooring arrangements and the need to preserve flexibility in mooring line configurations to achieve an appropriate restraining capacity;

.2 ships' structural elements, including accommodation, ventilation exhausts, cargo equipment or similar obstacles, on access; and

.3 special requirements for the location and selection of mooring equipment and fittings, for example special requirements for canal transits.

5.1.8 Unless the size and special features of the ship do not permit it, equipment and fittings in mooring areas should be positioned to provide shipboard personnel with unobstructed access to the following during mooring operations:

.1 mooring winches and winch controls;

.2 mooring fittings;

.3 mooring lines and mooring line stowage; and

.4 the space between shipside fairleads and winches to permit mooring personnel to safely apply stoppers to mooring lines when necessary.

5.1.9 The mooring arrangements should be designed to avoid the exposure of the shipboard personnel to lines under tension through snap-back or sudden movements of mooring lines. In this respect the following measures should be considered:

.1 locate winches close to shipside fairleads. The position of winches should not result in inappropriate mooring line orientations, or block or otherwise interfere with the use of shipside fairleads for additional mooring lines, connecting up of tugs for towage during mooring operations or the ability to safely moor the ship;

.2 enclosing the mooring line(s) behind barrier(s) provided that such enclosures do not adversely affect the performance of the mooring system and do not prevent effective inspection and maintenance of equipment, fittings and mooring lines;

.3 alternative design(s) where crew members do not need to work close to or have to pass mooring lines under tension or potentially under tension;

.4 use of appropriate, alternative means to moor the ship, including but not limited to automated mooring systems; or

.5 permanently fix mooring lines to a mooring winch.

5.1.10 Mooring areas should be considered as potential snap-back zones and signage should be provided to indicate that this is the case.

5.1.11 To minimize the need for manual handling of towing and mooring lines, the following measures should be considered:

.1 equipment and fitting arrangements should minimize the distance over which any mooring line may need to be handled;

.2 the use of fixed or dedicated mooring lines, taking into account the need to avoid inappropriate mooring line orientations, or block or otherwise interfere with the use of shipside fairleads for additional mooring lines, connecting up of tugs for towage during mooring operations or the ability to safely moor the ship;

.3 the layout to be designed to prevent manual intervention in transfer of the mooring line from storage drum to mooring winch drum and vice versa;

.4 use of spooling equipment;

.5 additional mooring lines should be available for immediate use, provided that their stowage does not interfere with the safe operation of the mooring equipment; and

.6 a sufficient number of mooring winches so that, during mooring operations, manual use of warping ends, stoppers, capstans and bitts is minimized, as far as possible.

5.1.12 The mooring arrangement design should take into account the principles for effective mooring arrangements included in appropriate industry guidance on mooring equipment and fittings.

5.2 Selection of equipment, fittings and mooring lines

5.2.1 The selection of winches should take into account:

.1 the availability of winches with alternative drum arrangements, including split drum arrangements, which can reduce the need for manual handling of mooring lines during mooring operations;

.2 the positioning of winch controls, including the availability of remote controls for winches to improve the line of sight and reduce operator exposure to snap-back;

.3 the availability of constant tension winches and their appropriateness for the normal operation of the ship; and

.4 limiting noise levels to ensure proper communication during mooring operations.

5.2.2 The selection of fittings should take into account:

.1 the type of mooring line with which the fitting is designed to be used. The design or selection of the fitting and the design of its hull supporting structure should be done in accordance with MSC.1/Circ.1175/Rev.1;

.2 the diameter D of surfaces of mooring fittings that are in contact with the mooring line in relation to the mooring line diameter d (D/d ratio) to reduce or mitigate bend loss of strength; and

.3 the need for the load-bearing surfaces of fittings to minimize damage from chafing and abrasion.

5.2.3 The selection of mooring lines should take into account:

.1 the guidance on mooring restraint as per appendix A of MSC.1/Circ.1175/Rev.1;

.2 the diameter D of surfaces of mooring fittings that are in contact with the mooring line in relation to the mooring line diameter d (D/d ratio) to reduce or mitigate bend loss of strength;

.3 the compatibility of the MBL_{SD} of mooring lines and the brake capacity of the mooring winches installed on board;

.4 the Line Design Break Force (LDBF) to be 100% to 105% of the MBL_{SD};

.5 the characteristics and limitations of mooring lines including material properties and environmental operating conditions anticipated during normal operation of the ship;

.6 the anticipated behaviour of the mooring line in the event of failure;

.7 the influence on stored energy and the potential for snap-back of high stiffness mooring lines caused by the use of tails; and

.8 as far as possible, but at least for lines in the same service (e.g. headlines, breast lines or springs), mooring lines of the same diameter and type (i.e. material) should be used.

5.2.4 To avoid overload on mooring winches, fittings and mooring lines, consideration should be given to select mooring winches with brake capacity of less than the ship design minimum breaking load of the mooring line or with adjustable brake capacity.

5.2.5 Fittings, particularly shipside fairleads, should be positioned to minimize the potential for chafing of mooring lines during the normal operation of the ship.

5.2.6 The selection of equipment and fittings including lines should take into account the principles for effective mooring arrangements included in appropriate industry guidance.

5.2.7 The mooring equipment, fittings and the mooring lines should at all times be compatible in design, diameter, strength, suitability, etc. and maintained with the original purpose and concept of the mooring arrangement.

5.2.8 Load limits

5.2.8.1 Notwithstanding the definitions in paragraph 2.1, LDBF of mooring lines made of nylon should be tested under wet and spliced conditions.

5.2.8.2 All components of a ship's mooring system, within defined tolerances, should be selected based on MBL_{SD}.

5.2.8.3 When selecting lines, the LDBF should be 100% to 105% of the MBL_{SD}.

5.2.8.4 The WLL of mooring lines should be used as user operating limiting values, not to be exceeded. The WLL is expressed as a percentage of MBL_{SD} and should be used as a limiting value in operational mooring analyses. Steel wires have a WLL of 55% of MBL_{SD} and all other cordage (synthetic) have a WLL of 50% of the MBL_{SD}.

6 Documentation on deviation

6.1 A supplement to the "Towing and mooring arrangements plan" should record the deviations if any, in relation to the following paragraphs:

.1 5.1.2 (where a straight lead is not possible);

.2 5.1.4 (unobstructed views);

.3 5.1.5 (protection of winch operators);

.4 5.1.8 (access to mooring equipment and fitting);

.5 5.1.9 (exposure of the shipboard personnel to lines under tension); and

.6 5.1.11 (minimize the need for manual handling of towing and mooring lines).

6.2 The documentation should include justification for such deviations and suitable safety measures, if any.

6.3 A reference to the supplement should be included in the towing and mooring arrangement plan so as to make the shipboard personnel aware of the safety measures which need to be considered during mooring operations.

References

(1) Oil Companies International Marine Forum (OCIMF), *Mooring Equipment Guidelines, 4th Edition 2018*, ISBN: 978-1-85609-771-0.

(2) Ian. C. Clark BSc, MSc, Master Mariner, MNI, *The Nautical Institute, Mooring and Anchoring Ships Vol.1, Principle and Practice*, ISBN: 9781906915934, 2009.

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ANNEX 3

DRAFT MSC CIRCULAR

GUIDELINES FOR INSPECTION AND MAINTENANCE OF MOORING EQUIPMENT INCLUDING LINES

1 The Maritime Safety Committee, at its [101st session (5 to 14 June 2019)], having considered a proposal by the Sub-Committee on Ship Design and Construction, at its sixth session, and recognizing the importance of inspection and maintenance of mooring equipment including lines, approved the Guidelines for inspection and maintenance of mooring equipment including lines, as set out in the annex.

2 Member States are invited to bring the annexed Guidelines to the attention of shipowners, ship managers, bareboat charterers and other organizations or persons responsible for operation of ships.

3 Member States are also invited to bring the annexed Guidelines to the attention of shipmasters, ships' officers and crew and all other parties concerned, for providing guidance on inspection and maintenance of mooring equipment including mooring lines.

ANNEX

GUIDELINES FOR INSPECTION AND MAINTENANCE OF MOORING EQUIPMENT INCLUDING LINES

1 General

1.1 Purpose

The purpose of these Guidelines is to provide recommendations and guidance for maintenance and in-service inspections of mooring equipment including lines and tails, criteria for identifying worn-out lines and tails for removal from service before failure, and criteria for selection of replacement mooring lines and tails.

1.2 Application

These Guidelines apply to all ships. Certain provisions are intended for reference by shipboard personnel, and other provisions are intended for Company personnel responsible for selecting and procuring replacement mooring lines.

2 Definitions

For the purpose of these Guidelines:

2.1 *Bend radius (D/d ratio)* means the diameter, D, of a mooring fitting divided by the diameter, d, of a mooring line that is led around or through the fitting. The D/d ratio is used by mooring line manufacturers to specify the minimum radius of a fitting around or through which a mooring line of diameter "d" should be led, in order to reduce or mitigate bend loss of strength of the mooring line.

2.2 *Company* means company, as defined in SOLAS regulation IX/1.2.

2.3 *Line Design Break Force* (LDBF) means the minimum force that a new, dry, spliced, mooring line will break at. This is for all synthetic cordage materials.

2.4 *Mooring arrangement* means the configuration of the mooring equipment and fittings and other design features of the ship related to the mooring operation, i.e. lighting and communication equipment.

2.5 *Mooring boat* means the boat handling mooring lines between the ship and ashore mooring facilities during mooring and unmooring operations and does not include harbour ship assist tugs (see FAL.6/Circ.11/Rev.1).

2.6 *Mooring equipment and fittings* means items such as winches, capstans, bollards, bitts, fairleads, rollers, chocks, etc. and also includes mooring lines.

2.7 *Mooring line configuration* means all components of an individual mooring line, including tails, eye splices, etc. Any change or replacement of a component is a change to the line's configuration, unless a component is replaced by a part having the same specification as in the original configuration.

2.8 *Mooring operations* means normal mooring and unmooring of the ship, including associated in-harbour towing movements.

2.9 *Mooring personnel* means personnel tasked to assist in the activity of mooring and unmooring ships, either ashore or from mooring boats, carried out within the framework of port marine services.

2.10 *Rotation of mooring lines* means periodical change of mooring lines for respective mooring drums to equalize the wear of mooring lines.

2.11 *Ship Design Minimum Breaking Load* (MBL_{SD}) means the minimum breaking load of new, dry, mooring lines for which shipboard fittings and supporting hull structures are designed in order to meet mooring restraint requirements.

2.12 *Towing and mooring arrangements plan* means the plan as described in section 5 of the annex to MSC.1/Circ.1175/Rev.1. This plan presents specific information regarding the towing and mooring fittings aboard the vessel, the mooring lines, as well as the arrangement of mooring lines and the acceptable environmental conditions for mooring.

3 Safe use of mooring equipment

3.1 Safe use of mooring equipment and fittings

Throughout its operational life, mooring equipment should be maintained and operated in accordance with the original design concept, if available, including when replacing parts and lines. In order to ensure all mooring equipment functions as designed, the Company should establish procedures for mooring operations, inspection and maintenance of mooring equipment, including mooring lines, taking into account appropriate references listed in paragraph 7 of these Guidelines.

3.2 Protection and storage of mooring line

To preserve the design life of mooring lines, the following practices should be followed during mooring operations:

.1 smooth contacts at turn-off points with large angles and/or eye splices; and

.2 using covers/mats at ship side to protect against any friction damage.

3.3 Control of mooring lines

3.3.1 The Company should establish procedures to allow the identification and control of mooring lines, tails and associated attachments when on board and to facilitate inspection and maintenance of mooring lines. Such procedures should include:

.1 providing a means of recording the number, type and location of mooring lines, tails and associated attachments. Such records may be included in either the towing and mooring arrangements plan or with records of inspection and maintenance or an alternative established by the requirements of the Company; and

.2 providing a means of linking specific mooring lines, tails and associated attachments to the relevant records and a manufacturer's certificate, if available.

3.3.2 Any defect discovered to the mooring lines during mooring operations should be immediately reported to the Master by all parties concerned including shore-based mooring personnel. If no actions are taken as appropriate the competent authorities should be informed, as necessary.

4 Inspection and maintenance of mooring lines

4.1 Inspection of mooring lines

4.1.1 To prevent the deterioration of mooring lines to a condition which may result in the failure of the line during mooring operations, the periodic inspection of mooring lines, mooring line tails and associated attachments should be included in the onboard maintenance plan or equivalent maintenance management system. The maintenance plan may be computer based.

4.1.2 The requirements for inspection of individual mooring lines will be specific to the type of mooring line used on board. In general, onboard inspection of mooring lines will be based on manufacturer recommendations and by visual inspection of the outside of the mooring line to identify excessive wear or damage, e.g. external abrasion, external cut, kink, heat damage such as fusion and slackening or fraying of eye splices. Such visual inspections should be based on:

.1 the recommendations of the mooring line and/or tail manufacturer, particularly the criteria provided for the assessment of mooring line condition;

.2 operational experience regarding the performance of the mooring line and/or mooring line tail during previous mooring operations; and

.3 the environmental conditions to which the mooring lines and/or mooring line tails are routinely exposed.

4.1.3 In the case of jacketed synthetic fibre mooring lines, detailed visual inspection of the condition of the synthetic fibre line may not be possible. The condition of the external jacket is not an accurate indicator of the condition of the load-bearing synthetic fibre material within the mooring line.

4.2 Maintenance of mooring lines

The Company should establish the maintenance procedures as required in paragraph 3.1.1 of these Guidelines. The maintenance procedures should specify replacement of in-service mooring lines and may include the rotation of mooring lines.

4.3 Criteria for condemning worn-out mooring lines

4.3.1 The replacement of in-service mooring lines which have been assessed as no longer suitable for use should be based on the removal prior to failure and in accordance with criteria provided by the manufacturer.

4.3.2 For visual inspection and replacement of mooring lines, additional advice is provided in industry guidance on mooring line and mooring line tail inspections.

4.4 Inspection and maintenance of equipment and fittings

4.4.1 Equipment and fittings should be properly inspected and maintained, based on the manufacturer's recommendations. Mooring equipment and fittings should be included in the onboard maintenance plan or equivalent maintenance management system. The maintenance plan may be computer based.

4.4.2 Maintenance should include the preservation, by appropriate means, of the clear marking of information on equipment and fittings, including SWL and winch control instructions.

4.4.3 Records of inspection and maintenance of equipment and fittings should be available on board.

4.4.4 Records of the original design concept, equipment, arrangement and specifications should be retained on board through the life cycle of the ship.

4.4.5 To preserve the design life of mooring lines and reduce the potential for failure during mooring operations any storage provided for additional (loose) mooring lines should minimize the exposure to harmful environments (e.g. UV light, water, chemicals, cargo, extreme temperature).

5 Selection of replacement mooring lines

5.1 When replacing mooring lines, compatibility with the mooring equipment and fittings on board, as specified in the mooring arrangement plan, should be taken into account. This should be achieved by selecting a replacement mooring line which meets the designed specifications. In cases where this is not possible, the following properties should be taken into consideration and the towing and mooring arrangement plan updated accordingly:

.1 breaking strength;

.2 environmental conditions to be used (e.g. temperature);

.3 linear density;

.4 tenacity;

.5 D/d ratios;

.6 compression fatigue; and

.7 stiffness.

5.2 Any increase in LDBF (Line Design Breaking Force) for the mooring lines above the limits specified, i.e. 100% to 105% of the MBL_{SD}, may require a review of the operating parameters and load limits of mooring equipment and fitting as well as of their hull supporting structures.

5.3 It should be noted that, when selecting replacement mooring lines, over time in service their strength will decay due to varying environmental conditions and thus the original service life expectations may not be achieved. Therefore, the Company should ensure that the condition of mooring lines is tracked throughout their service with the objective to replace the line before failure.

5.4 For wire ropes, corrosion protection should be considered.

5.5 For both wire and fibre mooring lines, the acceptable minimum bend radius (D/d ratio) recommended by the manufacturer should be taken into consideration as strength and life expectancy of these lines are directly related to the bend radius they are exposed to in service.

5.6 Where the acceptable minimum bend radius recommendations for a particular mooring line are not achievable, the service life of the line may be less than that stated by the manufacturer and therefore the line may need to be replaced before the end of the service life recommended by the manufacturer. The condition of lines regularly exposed to below the acceptable minimum bend radius should be subject to particular attention during inspections.

5.7 When selecting replacement mooring lines with high stiffness, including wire and high modulus synthetic lines, consideration should be given to the use of synthetic tails in order to reduce peak loading when the ship is secured alongside.

5.8 Consideration of the use of synthetic tails on high stiffness mooring lines should take into account industry and manufacturer guidance and the potential effects of synthetic tails on the stored energy of mooring lines under tension. The use of tails can change the characteristics of a mooring line and its behaviour in the event of failure. High stiffness mooring lines may exert significant dynamic force and have significant snap-back zones when used with synthetic tails that have a low stiffness.

6 Updating of ship documents and record-keeping

6.1 Records of inspection and maintenance of mooring equipment and inspection and replacement of mooring lines should be retained on board. Such records should be kept for a period determined by the Company, but in any event the records should be kept until completion of the next annual survey.

6.2 Consideration should be given to control and certification of mooring lines, wires, tails and associated attachments. Manufacturers' test certificates for mooring lines, joining shackles and synthetic tails should be kept on board and properly linked back to the equipment.

6.3 The items to be recorded during inspection and maintenance should be determined, taking into account the recommendations of the manufacturers of the mooring lines.

6.4 Any change of mooring line configuration requires updating of the towing and mooring arrangements plan.

References

(1) Oil Companies International Marine Forum (OCIMF), *Mooring Equipment Guidelines, 4th Edition 2018*, ISBN: 978-1-85609-771-0.

(2) Ian. C. Clark BSc, MSc, Master Mariner, MNI, *The Nautical Institute, Mooring and Anchoring Ships Vol.1, Principle and Practice*, ISBN: 9781906915934, 2009.

(3) Walter Vervloesem AMNI, *The Nautical Institute, Mooring and Anchoring Ships Vol.2, Inspection and Maintenance*, ISBN: 9781870077941, 2009.

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ANNEX 4

DRAFT MSC CIRCULAR*

GUIDANCE ON SHIPBOARD TOWING AND MOORING EQUIPMENT

1 The Maritime Safety Committee, at its eightieth session (11 to 20 May 2005)~~, following the recommendations made by the Sub-Committee on Ship Design and Equipment at its forty-eighth session,~~ approved guidance concerning shipboard equipment, fittings and supporting hull structures associated with towing and mooring~~, as set out in the annex, with a view to ensuring a uniform approach towards the application of the provisions of~~ for uniform implementation of SOLAS regulation II-1/3-8 adopted by resolution MSC.194(80), which ~~is expected to become~~ became effective on 1 January 2007.

2 The Committee, at its […] session ([…]), having considered a proposal by the Sub-Committee on Ship Design and Construction, at its […] session, with a view to ensuring a uniform approach towards the application of the provisions of SOLAS regulation II-1/3-8, as amended by resolution […] which is expected to become effective on [date of entry into force], approved the revised *Guidance on shipboard towing and mooring equipment*, as set out in the annex.

3 This revised guidance is applicable to ships constructed on or after [date of entry into force] and does not supersede the *Guidance on shipboard towing and mooring equipment* (MSC.1/Circ.1175) which remain applicable to ships constructed on or after 1 January 2007 but before [date of entry into force].

~~2~~4 Member Governments are invited to use the annexed guidance when applying the revised SOLAS regulation II-1/3-8, and to bring it to the attention of all parties concerned.

* Amended text shown in tracked changes using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.

ANNEX

SHIPBOARD EQUIPMENT, FITTINGS AND SUPPORTING HULL STRUCTURES ASSOCIATED WITH TOWING AND MOORING

1 Application

1.1 Under regulation II-1/3-8 of the 1974 SOLAS Convention, as adopted by resolution ~~MSC.194(80) in 2005~~ [insert appropriate reference for the pending revision of II-1/3-8], new displacement type ships, except high-speed craft and offshore units, shall be provided with arrangements, equipment and fittings of sufficient safe working load to enable the safe conduct of all towing and mooring operations associated with the normal operations of the ship. The arrangements, equipment and fittings shall meet the appropriate requirements of the Administration or an organization recognized by the Administration.

1.2 The *Revised guidance on shipboard towing and mooring equipment* (MSC.1/Circ.1175/Rev.1) should apply to ships constructed on or after [date of entry into force]. To ships constructed on or after 1 January 2007 and before [date of entry into force], the *Guidance on shipboard towing and mooring equipment* (MSC.1/Circ.1175) should apply.

1.~~2~~3 This circular ~~is intended to~~ provides standards for the design and construction of shipboard fittings and supporting hull structures associated with normal towing and mooring operations in harbours or sheltered waters, which Administrations are recommended to implement. This circular also contains design guidance for fittings of ships that are further intended to be towed by another ship or tug, e.g. in an emergency. ~~The provisions of this guidance do~~ This circular does not require tow lines nor mandate standards for mooring lines on board the ship. Furthermore, this guidance is not applicable to design and construction of shipboard fittings and supporting hull structures used for special towing services defined as:

.1 *Escort towing*: Towing service required in some estuaries to control the ship in case of failures of the propulsion or steering system. It should be referred to local escort requirements;

.2 *Canal transit towing*: Towing service for ships transiting canals, e.g. the Panama Canal. It should be referred to local canal transit requirements; and

.3 *Emergency towing for tankers*: Towing service to assist tankers in case of emergency. It should be referred to paragraph 1 of SOLAS regulation II-1/3-4.

1.~~3~~4 Equipment that is used for both towing and mooring should be in accordance with sections 3 and 4.

2 Definitions

For the purpose of this guidance:

2.1 *Normal towing* means towing operations necessary for manoeuvring in ports and sheltered waters associated with the normal operations of the ship.

2.2 *Other towing* means towing by another ship or a tug, such as to assist the ship in case of emergency.

2.~~1~~3 *Shipboard fittings* mean bollards and bitts, fairleads, ~~stand~~ pedestal rollers and chocks used for ~~the normal~~ mooring of the ship and similar components used for ~~the~~ normal or other towing of the ship. ~~Other components such as capstans, winches, etc. are not covered by this guidance.~~ Any weld, bolt or other fastening connecting the shipboard fitting to the supporting hull structure is part of the shipboard fitting and subject to any industry standard applicable to such fitting.

2.~~2~~4 *Supporting hull structure* means that part of the ship structure on/in which the shipboard fitting is placed and which is directly submitted to the forces exerted on the shipboard fitting. The hull structure supporting capstans, winches, etc. used for ~~the~~ normal or other towing and mooring operations mentioned above should also be subject to this guidance.

2.~~3~~5 *Industry standard* means international or national standards which are recognized in the country where the ship is built, subject to the approval of the Administration.

2.6 *Safe working load (SWL)* means the safe load limit of shipboard fittings used for mooring operations in harbours or similar sheltered waters.

2.7 *Safe towing load (TOW)* means the safe load limit of shipboard fittings used for normal and other towing.

2.8 *Ship Design Minimum Breaking Load (MBL_{SD})* means the minimum breaking load of new, dry mooring lines for which shipboard fittings and supporting hull structures are designed in order to meet mooring restraint requirements.

3 Towing ~~fittings~~

3.1 Strength

The strength of shipboard fittings used for normal towing operations and their supporting hull structures should comply with the provisions of 3.2 to 3.6. Where a ship is equipped with shipboard fittings intended to be used for other towing services, the strength of these fittings and their supporting hull structures should also comply with these provisions. The strength of shipboard fittings intended to be used for both towing and mooring and of their supporting hull structures should also comply with the provisions of section 4.

3.2 Arrangements

Shipboard fittings for towing should be located on ~~longitudinals, beams~~ stiffeners and/or girders which are part of the deck construction so as to facilitate efficient distribution of the towing load. Other equivalent arrangements may be accepted (for ~~Panama chocks,~~ chocks in bulwarks, etc.), provided the strength is confirmed as adequate for the intended service.

3.3 Load considerations

3.3.1 The minimum design load ~~used for~~ applied to supporting hull structures for shipboard fittings should be:

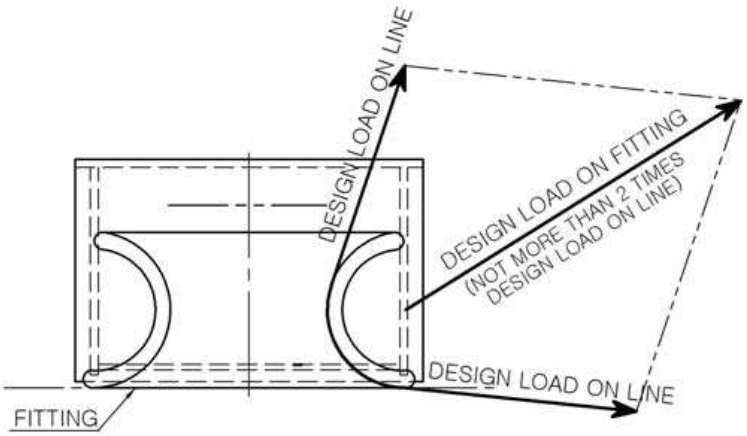
.1 for normal towing operations ~~(e.g. harbour/manoeuvring) should be~~, 1.25 times the intended maximum towing load (e.g. static bollard pull), as indicated on the towing and mooring arrangements plan. ~~The design load should be applied through the tow line according to the arrangement shown on the towing and mooring arrangements plan.~~

~~3.3~~.2 ~~For~~ for other ~~towage~~ towing services ~~(e.g. escort)~~, ~~the design load used for each fitting should be the nominal breaking strength of the tow line defined in table 1 based on the equipment number (EN) described in the appendix.~~ the ship design minimum breaking load of the tow line defined in appendix A; and

.3 for fittings intended to be used for both normal and other towing operations, the greater of the design loads according to .1 and .2.

~~3.3.3 The method of application of the design load to the fittings and supporting hull structure should be taken into account such that the total load need not be more than twice the design load specified in 3.3.1 or 3.3.2, i.e. no more than one turn of one line (see figure below).~~

3.3.2 The design load should be applied to fittings in all directions that may occur by taking into account the arrangement shown on the towing and mooring arrangements plan. Where the towing line takes a turn at a fitting, the total design load applied to the fitting is equal to the resultant of the design loads acting on the line. However, in no case does the design load applied to the fitting need to be more than twice the design load on the line as specified in 3.3.1 (see figure below).



3.4 Shipboard fittings

~~The selection of shipboard fittings should be made by the shipyard in accordance with industry standards (e.g. ISO 3913:1977 Shipbuilding-Welded steel bollards) accepted by the Administration.~~

3.4.1 Shipboard fittings may be selected from an industry standard accepted by the Administration and at least based on the following loads:

.1 for normal towing operations, the intended maximum towing load (e.g. static bollard pull) as indicated on the towing and mooring arrangements plan;

.2 for other towing services, the ship design minimum breaking load of the tow line according to appendix A; and

.3 for fittings intended to be used for both normal and other towing operations the greater of the loads according to .1 and .2.

3.4.2 When the shipboard fitting is not selected from an accepted industry standard, the ~~design load used to assess its~~ strength of the fitting and of its attachment to the ~~ship~~ supporting hull structure should be in accordance with 3.3 ~~above~~ and 3.5.

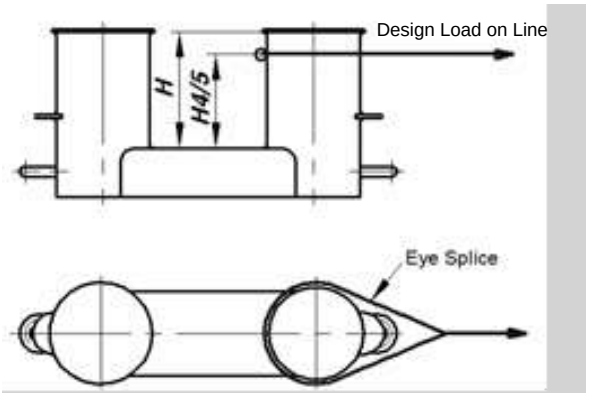
3.5 Supporting hull structure

~~*Arrangement*~~

3.5.1 The ~~arrangement of the reinforced~~ reinforcing members ~~(carling)~~ beneath shipboard fittings should ~~consider~~ be effectively arranged for any variation of direction (~~laterally~~ horizontally and vertically) of the towing forces ~~(which should be not less than the design load as per 3.3)~~ acting ~~through the arrangement of connection to~~ upon the shipboard fittings. Proper alignment of fitting and supporting hull structures should be ensured.

~~*Acting point of towing force*~~

3.5.2 The acting point of the towing force on shipboard fittings should be taken at the attachment point of a towing line or at a change in its direction. For bollards and bitts the attachment point of the towing line should be taken not less than 4/5 of the tube height above the base (see figure below).



~~*Allowable stresses*~~

3.5.3 ~~Allowable bending stress:~~ Under the design load conditions as specified in 3.3 the allowable normal stress should be taken as 100% ~~of the specified yield point for the material used;~~ and the allowable shearing stress~~:~~ as 60% of the specified yield point for the material used~~;~~. Normal stress is the sum of bending stress and axial stress with the corresponding shearing stress acting perpendicular to the normal stress. ~~no~~ No stress concentration factors being taken into account.

3.6 Safe ~~working~~ towing load (~~SWL~~ TOW)

3.6.1 ~~The SWL~~ TOW used for normal towing operations ~~(harbour/manoeuvring)~~ should not exceed 80% of the design load as given in 3.3.1 (1) and ~~the SWL~~ TOW used for other towing operations ~~(e.g. escort~~ should not exceed 80% of the design load as given in 3.3.~~2~~1 (2) For fittings used for, both, ~~harbour and escort purposes~~ normal and other towing operations, the greater of the ~~design~~ safe towing loads ~~of 3.3.1 and 3.3.2~~ should be used.

3.6.2 ~~The SWL~~ TOW, in tonnes, of each shipboard fitting should be marked (by weld bead or equivalent) on the ~~deck~~ fittings ~~used for towing~~ intended for towing. For fittings intended to be used for, both, towing and mooring, SWL, in tonnes, according to 4.6, should be marked in addition to TOW.

3.6.3 The above provisions on ~~SWL~~ TOW apply for ~~a single post basis (no more than one turn of one line)~~ the use of no more than one towing line.

3.6.4 The towing and mooring arrangements plan described in section 5 should define the method of use of towing lines.

4 Mooring ~~fittings~~

4.1 Strength

The strength of shipboard fittings used for mooring operations and of their supporting hull structures as well as the strength of supporting hull structures of winches and capstans should comply with the provisions of 4.2 to 4.6. The strength of shipboard fittings, intended to be used for both, mooring and towing, and of their supporting hull structures, should also comply with the provisions of section 3.

4.2 Arrangements

Shipboard fittings, winches and capstans for mooring should be located on ~~longitudinals, beams~~ stiffeners and/or girders, which are part of the deck construction, so as to facilitate efficient distribution of the mooring load. Other equivalent arrangements may be accepted (for ~~Panama~~ chocks in bulwarks, etc.) provided the strength is confirmed adequate for the service.

4.3 Load considerations

4.3.1 The minimum design load applied to ~~shipboard fittings and~~ supporting hull structures ~~should be 1.25 times the breaking strength of the mooring line provided in accordance with table 1 based on the equipment number (EN) described in the appendix. The design load should be applied through the mooring line according to the arrangement shown on the towing and mooring arrangements plan~~ :

.1 of shipboard fittings should be 1.15 times the ship design minimum breaking load of the mooring line provided in accordance with appendix A;

~~4.3.2 The design load applied to supporting hull structures for winches, etc. should be 1.25 times the breaking strength of the mooring line according to 4.3.1 above and, for capstans, 1.25 times the maximum hauling-in force. The design load should be applied through the mooring line according to the arrangement shown on the towing and mooring arrangements plan.~~

.2 of winches should be 1.25 times the intended maximum brake holding load, where the maximum brake holding load should be assumed not less than 80% of the ship design minimum breaking load of the mooring line according to appendix A; and

.3 of capstans, 1.25 times the maximum hauling-in force.

~~4.3.3 The method of application of the design load to the fittings and supporting hull structure should be taken into account such that the total load need not be more than twice the design load specified in 4.3.1, i.e. no more than one turn of one line.~~

4.3.2 The design load should be applied to fittings in all directions that may occur by taking into account the arrangement shown on the towing and mooring arrangements plan. Where the mooring line takes a turn at a fitting the total design load applied to the fitting is equal to the resultant of the design loads acting on the line. However, in no case does the design load need to be more than twice the design load on the line as specified in 4.3.1 (see figure in 3.3).

4.4 Shipboard fittings

4.4.1 ~~The selection of s~~Shipboard fittings ~~should be made by the shipyard in accordance with~~ may be selected from industry standards ~~(e.g. ISO 3913:1977 Shipbuilding-Welded steel bollards)~~ accepted by the Administration at least based on the ship design minimum breaking load of the mooring line according to appendix A.

4.4.2 When the shipboard fitting is not selected from an accepted industry standard, the strength of the fittings and of its attachment to the supporting hull structure should be ~~equivalent to a recognized industry standard in compliance with the design load as per 4.3~~ in accordance with 4.3 and 4.5.

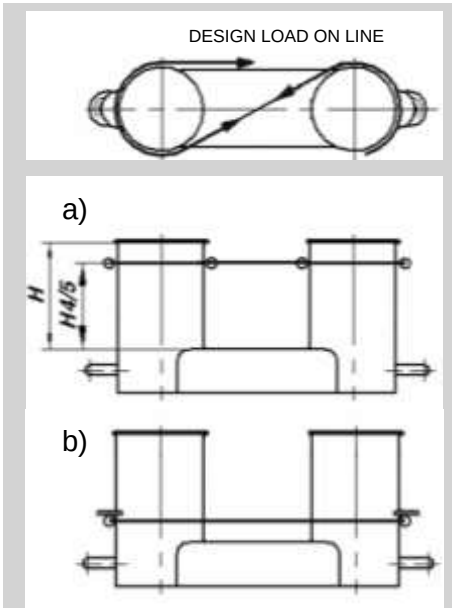
4.5 Supporting hull structure

~~*Arrangement*~~

4.5.1 ~~The a~~Arrangement of ~~the reinforced~~ reinforcing members ~~(carling)~~ beneath shipboard fittings, winches and capstans should consider any variation of direction (~~laterally~~ horizontally and vertically) of the mooring forces ~~(which should be not less than the design load given in 4.3)~~ acting ~~through the arrangement of connection to~~ upon the shipboard fittings. Proper alignment of fitting and supporting hull structures should be ensured.

~~*Acting point of mooring force*~~

4.5.2 The acting point of the mooring force on shipboard fittings should be taken at the attachment point of a mooring line or at a change in its direction. For bollards and bitts the attachment point of the mooring line should be taken not less than 4/5 of the tube height above the base (see figure a) below). However, if fins are fitted to the bollard tubes to keep the mooring line as low as possible, the attachment point of the mooring line may be taken at the location of the fins (see figure b) below.



~~*Allowable stresses*~~

4.5.3 ~~Allowable bending stress: 100% of the specified yield point for the material used; allowable shearing stress: 60% of the specified yield point for the material used;~~ Under the design load conditions, as specified in 4.3, the allowable normal stress should be taken as 100% and the allowable shearing stress as 60% of the specified yield point for the material used. Normal stress is the sum of bending stress and axial stress with the corresponding shearing stress acting perpendicular to the normal stress. ~~n~~No stress concentration factors being taken into account.

4.6 Safe working load (SWL)

~~4.6.1 The SWL should not exceed 80% of the design load given in 4.3.~~

4.6.1 The SWL, for the purpose of marking, should be equal to the ship design minimum breaking load of the mooring line according to appendix A.

4.6.2 The SWL, in tonnes, of each shipboard fitting should be marked (by weld bead or equivalent) on the ~~deck~~ fittings ~~used~~ intended for mooring. For fittings intended to be used for both mooring and towing, TOW, in tonnes, according to 3.6, should be marked in addition to SWL.

4.6.3 The above provisions on SWL apply for ~~a single post basis (no more than one turn of one line)~~ the use of no more than one mooring line.

4.6.4 The towing and mooring arrangements plan described in section 5 should define the method of use of mooring lines.

5 Towing and mooring arrangements plan

5.1 The SWL and TOW for the intended use for each shipboard fitting should be noted in the towing and mooring arrangements plan available on board for the guidance of the Master. It should be noted that TOW is the load limit for towing purposes and SWL that for mooring purposes.

5.2 Information provided ~~on~~ in the plan should include, in respect of each shipboard fitting:

.1 location on the ship;

.2 fitting type;

.3 SWL / TOW;

.4 purpose (mooring~~/harbour towing/escort towing~~, normal towing or other towing); and

.5 method of applying load of towing or mooring line including limiting fleet angle~~s~~, i.e. angle of change in direction of a line at the fitting.

5.3 Furthermore, information provided on the plan is to include:

.1 the arrangement of mooring lines showing number of lines (N);

.2 the ship design minimum breaking load of each mooring line (MBL_{SD});

.3 the length of each mooring line;

.4 restrictions or limitations on the type (including material and construction), stiffness and diameter of mooring lines which are compatible with the mooring equipment and fittings; and

.5 the acceptable environmental conditions as given in appendix A, section 3 for the recommended ship design minimum breaking load of mooring lines for ships with Equipment Number EN > 2000:

.1 30 second mean wind speed from any direction (v_W or v_W* according to 3.1.3 or 3.2.2, respectively); and

.2 maximum current speed acting on bow or stern (±10°).

Note: When the applied design environmental criteria exceed the above given criteria, information provided in the plan should include the design environmental criteria, similar to the parameters in appendix A:

.1 wind speed and direction; and

.2 current speed and direction.

~~Table 1~~
APPENDIX A

MOORING AND TOW LINES

1 General

1.1 The mooring lines for ships with Equipment Number (EN) of less than or equal to 2,000 are given in section 2. For other ships the mooring lines are given in section 3.

1.2 The applicable provisions for tow lines are given in section 2.

1.3 The EN should be calculated in compliance with appendix B. Deck cargo as given by the loading manual should be included for the determination of side-projected area A.

1.4 Sections 2 and 3 specify the minimum recommended number and minimum strength of mooring lines (MBL_{SD}). The designer should consider to verify the adequacy of mooring lines based on assessments carried out for the individual mooring arrangement, expected shore-side mooring facilities and expected prevalent environmental conditions.

2 Mooring lines for ships with EN ≤ 2000 and tow lines

2.1 The minimum recommended mooring lines for ships having an EN of less than or equal to 2,000 are given in table 1.

2.2 For ships having the ratio A/EN > 0.9 the following number of lines should be added to the number of mooring lines as given in table 1:

one line where $0.9 < \frac{A}{EN} \leq 1.1$,

two lines where $1.1 < \frac{A}{EN} \leq 1.2$,

three lines where $1.2 < \frac{A}{EN}$.

2.3 The tow lines are given in table 1 and are intended as own tow line of a ship to be towed by a tug or another ship.

MOORING AND TOW LINES

EQUIPMENT NUMBER		MOORING LINES	TOW LINE*
Exceeding	Not exceeding	Minimum breaking strength (kN)	Breaking strength (kN)
1	*2*	*3*	*4*
50	70	34	98
70	90	37	98
90	110	39	98
110	130	44	98
130	150	49	98
150	175	54	98
175	205	59	112
205	240	64	129
240	280	69	150
280	320	74	174
320	360	78	207
360	400	88	224
400	450	98	250
450	500	108	277
500	550	123	306
550	600	132	338
600	660	147	370
660	720	157	406
720	780	172	441
780	840	186	479
840	910	201	518
910	980	216	559
980	1060	230	603
1060	1140	250	647
1140	1220	270	691
1220	1300	284	738
1300	1390	309	786
1390	1480	324	836
1480	1570	324	888
1570	1670	333	941
1670	1790	353	1024
1790	1930	378	1109
1930	2080	402	1168
2080	2230	422	1259
2230	2380	451	1356
2380	2530	480	1453
2530	2700	480	1471
2700	2870	490	1471
2870	3040	500	1471
3040	3210	520	1471
3210	3400	554	1471

EQUIPMENT NUMBER		MOORING LINES	TOW LINE*
Exceeding	Not exceeding	Minimum breaking strength (kN)	Breaking strength (kN)
1	*2*	*3*	*4*
3400	3600	588	1471
3600	3800	618	1471
3800	4000	647	1471
4000	4200	647	1471
4200	4400	657	1471
4400	4600	667	1471
4600	4800	677	1471
4800	5000	686	1471
5000	5200	686	1471
5200	5500	696	1471
5500	5800	706	1471
5800	6100	706	1471
6100	6500	716	
6500	6900	726	
6900	7400	726	
7400	7900	726	
7900	8400	736	
8400	8900	736	
8900	9400	736	
9400	10000	736	
10000	10700	736	
10700	11500	736	
11500	12400	736	
12400	13400	736	
13400	14600	736	
14600	16000	736	

* Information is provided in relation to 3.3.2 and provision onboard of such a line is not necessary under this guidance.

Table 1: Mooring and tow lines for ships with EN ≤ 2000

EQUIPMENT NUMBER		MOORING LINES		TOW LINE*
Exceeding	**Not exceeding**	**No. of mooring lines**	**Ship design minimum breaking load (kN)**	**Ship design minimum breaking load (kN)**
1	***2***	***3***	***4***	***5***
50	70	3	37	98
70	90	3	40	98
90	110	3	42	98
110	130	3	48	98
130	150	3	53	98
150	175	3	59	98
175	205	3	64	112
205	240	4	69	129
240	280	4	75	150
280	320	4	80	174
320	360	4	85	207
360	400	4	96	224
400	450	4	107	250
450	500	4	117	277
500	550	4	134	306
550	600	4	143	338
600	660	4	160	370
660	720	4	171	406
720	780	4	187	441
780	840	4	202	479
840	910	4	218	518
910	980	4	235	559
980	1,060	4	250	603
1,060	1,140	4	272	647
1,140	1,220	4	293	691
1,220	1,300	4	309	738
1,300	1,390	4	336	786
1,390	1,480	4	352	836
1,480	1,570	5	352	888
1,570	1,670	5	362	941
1,670	1,790	5	384	1,024
1,790	1,930	5	411	1,109
1,930	2,080	5**	437**	1,168
2,080	2,230	**	**	1,259
2,230	2,380	**	**	1,356
2,380	2,530	**	**	1,453
2,530	-	**	**	1,471

* Information is provided in relation to 3.3.1.2 and 3.4.1.2 of the annex to *Revised guidance and provision on board of such a line is not necessary under this guidance*.

** For ships with EN > 2,000 see section 3 of appendix A.

3 Mooring lines for ships with EN > 2,000

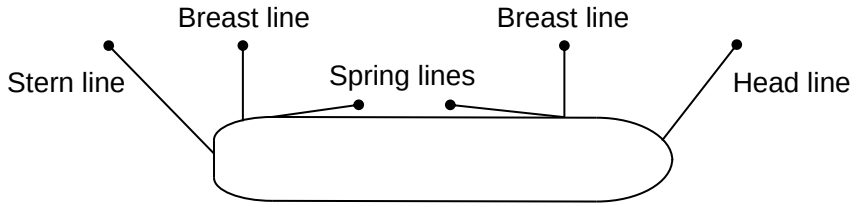
3.1 General

3.1.1 The following is defined with respect to the purpose of mooring lines (see also figure below):

.1 *Breast line*: A mooring line that is deployed perpendicular to the ship, restraining the ship in the off-berth direction;

.2 *Spring line*: A mooring line that is deployed almost parallel to the ship, restraining the ship in fore or aft direction; and

.3 *Head/Stern line*: A mooring line that is oriented between longitudinal and transverse direction, restraining the ship in the off-berth and in fore or aft direction. The amount of restraint in fore or aft and off-berth direction depends on the line angle relative to these directions.



.4 Breast lines provide the maximum transverse restraint and spring lines the maximum longitudinal restraint against vessel movement in athwart and in fore-aft direction, respectively. Head and stern lines are much less effective for these purposes. The applied mooring layout should follow these principles as far as possible with respect to the port facilities and as far as reasonable with respect to the vertical line angles.

3.1.2 The strength of mooring lines and the number of head, stern and breast lines for ships with an EN > 2,000 are based on the side-projected area A_1. Side projected area A_1 should be calculated similar to the side-projected area A according to appendix B but considering the following conditions:

.1 For oil tankers, chemical tankers, bulk carriers and ore carriers the lightest ballast draft should be considered for the calculation of the side-projected area A_1. For other ships the lightest draft of usual loading conditions should be considered if the ratio of the freeboard in the lightest draft and the full load condition is equal to or above two. Usual loading conditions mean loading conditions as given by the trim and stability booklet that are to be expected to regularly occur during operations, excluding light weight conditions, propeller inspection conditions, etc.

.2 Wind shielding of the pier can be considered for the calculation of the side-projected area A_1 unless the ship is intended to be regularly moored to jetty-type piers. A height of the pier surface of 3 m above the waterline may be assumed, i.e. the lower part of the side-projected area with a height of 3 m above the waterline for the considered loading condition may be disregarded for the calculation of the side-projected area A_1.

.3 Deck cargoes as given by the loading manual should be included for the determination of side-projected area A_1. Deck cargo may not need to be considered if a usual light draft condition without cargo on deck generates a larger side-projected area A_1 than the full load condition with cargo on deck. The larger of both side-projected areas should be chosen as side-projected area A_1.

3.1.3 The mooring lines as given hereunder are based on a maximum current speed of 1.0 m/s and the following maximum wind speed v_w, in m/s:

v_w = 25.0 - 0.002 (A_1 – 2,000) for passenger ships, ferries and car carriers with 2,000 $m^2 < A_1 \leq 4{,}000\ m^2$

= 21.0 for passenger ships, ferries and car carriers with $A_1 > 4{,}000\ m^2$

= 25.0 for other ships

3.1.4 The wind speed is considered representative of a 30 second mean speed from any direction and at a height of 10 m above the ground. The current speed is considered representative of the maximum current speed acting on bow or stern (±10°) and at a depth of one-half of the mean draft. Furthermore, it is considered that ships are moored to solid piers that provide shielding against cross current.

3.1.5 Additional loads caused by, for example, higher wind or current speeds, cross currents, additional wave loads or reduced shielding from non-solid piers may need to be particularly considered. Furthermore, it should be observed that unbeneficial mooring layouts can considerably increase the loads on single mooring lines.

3.2 Ship design minimum breaking load

3.2.1 The ship design minimum breaking load, in kN, of the mooring lines should be taken as:

$$MBL_{SD} = 0.1 \cdot A_1 + 350$$

3.2.2 The ship design minimum breaking load may be limited to 1,275 kN (130 t). However, in this case the moorings are to be considered as not sufficient for environmental conditions given by A.3.1.3. For these ships, the acceptable wind speed v_w,* in m/s, can be estimated as follows:

$$v_w^* = v_w \cdot \sqrt{\frac{MBL_{SD}{}^*}{MBL_{SD}}}$$

where v_w is the wind speed as per 3.1.3 above, MBL_{SD}* the breaking strength of the mooring lines intended to be supplied and MBL_{SD} the breaking strength as recommended according to the above formula. However, the ship design minimum breaking load should not be taken less than corresponding to an acceptable wind speed of 21 m/s:

$$MBL_{SD}{}^* \geq \left(\frac{21}{v_w}\right)^2 \cdot MBL_{SD}$$

3.2.3 If lines are intended to be supplied for an acceptable wind speed v_w* higher than v_w as per 3.1.3, the ship design minimum breaking load should be taken as:

$$MBL_{SD}{}^{*} = \left(\frac{v_w^*}{v_w}\right)^2 \cdot MBL_{SD}$$

3.3 Number of mooring lines

3.3.1 The total number of head, stern and breast lines should be taken as:

$$n = 8.3 \cdot 10^{-4} \cdot A_1 + 6$$

3.3.2 For oil tankers, chemical tankers, bulk carriers and ore carriers the total number of head, stern and breast lines should be taken as:

$$n = 8.3 \cdot 10^{-4} \cdot A_1 + 4$$

3.3.3 The total number of head, stern and breast lines should be rounded to the nearest whole number.

3.3.4 The number of head, stern and breast lines may be increased or decreased in conjunction with an adjustment to the strength of the lines. The adjusted strength, MBL_{SD},** should be taken as:

MBL_{SD}** = 1.2 · MBL_{SD} · n/n** ≤ MBL_{SD} for increased number of lines,

MBL_{SD}** = MBL_{SD} · n/n** for reduced number of lines,

where MBL_{SD} is MBL_{SD} or MBL_{SD}* specified in 3.2, as appropriate; n** is the increased or decreased total number of head, stern and breast lines and n the number of lines for the considered ship type as calculated according to 3.3.1 or 3.3.2 without rounding.

3.3.5 Vice versa, the strength of head, stern and breast lines may be increased or decreased in conjunction with an adjustment to the number of lines.

3.3.6 The total number of spring lines should be taken not less than:

two lines where EN < 5,000; and

four lines where EN ≥ 5,000.

3.3.7 The strength of spring lines should be the same as that of the head, stern and breast lines. If the number of head, stern and breast lines is increased in conjunction with an adjustment to the strength of the lines, the number of spring lines should be taken as follows, but rounded up to the nearest even number:

$$n_S^* = MBL_{SD} / MBL_{SD}^{**} \cdot n_S$$

where MBL_{SD} is MBL_{SD} or MBL_{SD}* specified in 3.2, as appropriate, MBL_{SD}** the adjusted strength of lines as specified in 3.3.4, n_S the number of spring lines as given in 3.3.6 and n_S* the increased number of spring lines.

~~APPENDIX~~
APPENDIX B

EQUIPMENT NUMBER

The equipment number (EN) should be calculated as follows:

$$EN = \Delta^{2/3} + 2.0hB + \frac{A}{10}$$

where:

Δ= ~~m~~Moulded displacement, in t~~onnes~~, to the Summer Load Waterline.

B = ~~m~~Moulded breadth, in m~~etres~~.

h = ~~e~~Effective height, in m~~etres~~, from the Summer Load Waterline to the top of the uppermost house; for the lowest tier 'h' should be measured at centreline from the upper deck or from a notional deck line where there is local discontinuity in the upper deck, see figure below for an example.

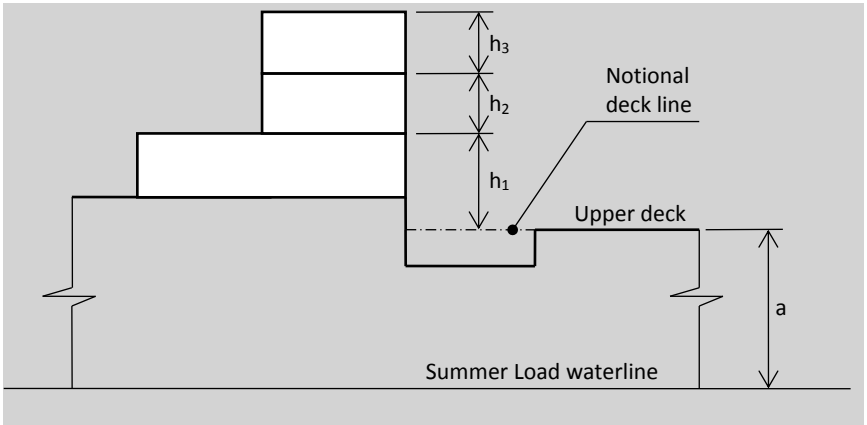
h = a + Σh_i

~~where:~~

a = Distance, in m~~etres~~, from the Summer Load Waterline amidships to the upper deck.

hi = Height, in m~~etres~~, on the centreline of each tier of houses having a breadth greater than B/4.

A = Side-projected area, in ~~square metres~~ m^2, of the hull, superstructures and houses above the Summer Load Waterline which are within the equipment length of the ship and also have a breadth greater than B/4.

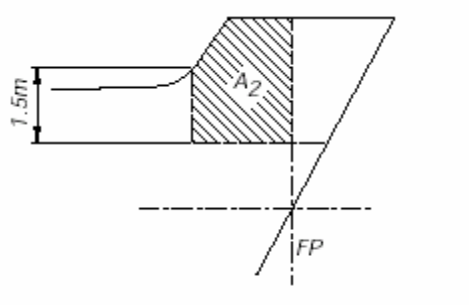


NOTES:

1 When calculating h, sheer and trim should be ignored, i.e. h is the sum of freeboard amidships plus the height (at centreline) of each tier of houses having a breadth greater than B/4.

2 If a house having a breadth greater than B/4 is above a house with a breadth of B/4 or less, then the wide house should be included but the narrow house ignored.

3 Screens or bulwarks 1.5 m or more in height should be regarded as parts of houses when determining h and A. The height of the hatch coamings and that of any deck cargo, such as containers, may be disregarded when determining h and A. With regard to determining A, when a bulwark is more than 1.5 m high, the area shown below as A2 should be included in A.



4 The equipment length of the ships is the length between perpendiculars but should not be less than 96% nor greater than 97% of the extreme length on the Summer Waterline (measured from the forward end of the waterline).

***

ANNEX 5

DRAFT AMENDMENTS TO PARTS B-1 TO B-4 OF SOLAS CHAPTER II-1*
(includes amendments adopted resolution MSC.421(98))

PART A
GENERAL

Regulation 1
Application

1.3 For the purpose of this chapter:

.1 the expression ships constructed means ships the keels of which are laid or which are at a similar stage of construction;

.2 the expression ships constructed on or after 1 January 2024 means:

.1 for which the building contract is placed on or after 1 January 2024; or

.2 in the absence of a building contract, the keel of which is laid or which are at a similar stage of construction on or after 1 July 2024; or

.3 the delivery of which is on or after 1 January 2028.

.~~2~~ 3 the expression all ships means ships constructed before, on or after 1 January 2009;

.~~3~~ 4 a cargo ship, whenever built, which is converted to a passenger ship shall be treated as a passenger ship constructed on the date on which such a conversion commences.

[PART B-1**
STABILITY

Regulation 7-2
Calculation of the factor s_i

5.2 The factor s_i is to be taken as zero in those cases where the final waterline, taking into account sinkage, heel and trim, immerses:

.1 for cargo ships, the lower edge of openings through which progressive flooding may take place and such flooding is not accounted for in the calculation of factor s_i. Such openings shall include air pipes, ventilators and openings which are closed by means of weathertight doors or hatch covers; ~~and~~

* Amended text shown in tracked changes using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.

** Pending the Committee's endorsement of the Sub-Committee's recommendation (see paragraph 4.19).

.2 any part of the bulkhead deck in passenger ships considered a horizontal evacuation route for compliance with chapter II-2~~.~~; and

.3 for passenger ships subject to the provisions of regulation 1.1.1.1 and constructed before 1 January 2024, the lower edge of openings through which progressive flooding may take place and such flooding is not accounted for in the calculation of factor s_i. Such openings shall include air pipes, ventilators and openings which are closed by means of weathertight doors or hatch covers.

5.3 The factor s_i is to be taken as zero if, taking into account sinkage, heel and trim, any of the following occur in any intermediate stage or in the final stage of flooding:

.1 immersion of any vertical escape hatch in the bulkhead deck of passenger ships and the freeboard deck of cargo ships intended for compliance with chapter II-2;

.2 any controls intended for the operation of watertight doors, equalization devices, valves on piping or on ventilation ducts intended to maintain the integrity of watertight bulkheads from above the bulkhead deck of passenger ships and the freeboard deck of cargo ships become inaccessible or inoperable;

.3 immersion of any part of piping or ventilation ducts located within the assumed extent of damage and carried through a watertight boundary if this can lead to the progressive flooding of compartments not assumed as flooded~~.~~; and

.4 for passenger ships constructed on or after 1 January 2024, immersion of the lower edge of openings through which progressive flooding may take place and such flooding is not accounted for in the calculation of factor s_i. Such openings shall include air pipes, ventilators and openings which are closed by means of weathertight doors or hatch covers.

5.5 Except as provided in paragraph 5.3.1, openings closed by means of watertight manhole covers and flush scuttles, remotely operated sliding watertight doors, side scuttles of the non-opening type as well as watertight access doors and watertight hatch covers required to be kept closed ~~at sea~~ during navigation in accordance with regulations 22 to 24 need not be considered.]

PART B-2
SUBDIVISION, WATERTIGHT AND WEATHERTIGHT INTEGRITY

Regulation 12
Peak and machinery space bulkheads, shaft tunnels, etc.

6.1 For ships subject to the provisions of regulation 1.1.1.1 and constructed before 1 January 2024, ~~E~~except as provided in paragraph 6.~~2~~3, the collision bulkhead may be pierced below the bulkhead deck of passenger ships and the freeboard deck of cargo ships by not more than one pipe for dealing with fluid in the forepeak tank, provided that the pipe is fitted with a screw-down valve capable of being operated from above the bulkhead deck of passenger ships and the freeboard deck of cargo ships, the valve being located inside the forepeak at the collision bulkhead. The Administration may, however, authorize the fitting of this valve on the after side of the collision bulkhead provided that the valve is readily accessible

under all service conditions and the space in which it is located is not a cargo space. Alternatively, for cargo ships, the pipe may be fitted with a butterfly valve suitably supported by a seat or flanges and capable of being operated from above the freeboard deck. All valves shall be of steel, bronze or other approved ductile material. Valves of ordinary cast iron or similar material are not acceptable.

6.2 For ships constructed on or after 1 January 2024, except as provided in paragraph 6.3, the collision bulkhead may be pierced below the bulkhead deck of passenger ships and the freeboard deck of cargo ships by not more than one pipe for dealing with fluid in the forepeak tank, provided that the pipe is fitted with a remotely controlled valve capable of being operated from above the bulkhead deck of passenger ships and the freeboard deck of cargo ships. The valve shall be normally closed. If the remote control system should fail during operation of the valve, the valve shall close automatically or be capable of being closed manually from a position above the bulkhead deck of passenger ships and the freeboard deck of cargo ships. The valve shall be located at the collision bulkhead on either the forward or aft side, provided the space on the aft side is not a cargo space. The valve shall be of steel, bronze or other approved ductile material. Valves of ordinary cast iron or similar material are not acceptable.

Note: renumber subsequent paragraphs

Regulation 13
Openings in watertight ~~bulkheads~~ boundaries below the bulkhead deck in passenger ships

1 The number of openings in watertight ~~bulkheads~~ boundaries shall be reduced to the minimum compatible with the design and proper working of the ship, satisfactory means shall be provided for closing these openings.

2.1 Where pipes, scuppers, electric cables, etc., are carried through watertight ~~bulkheads~~ boundaries, arrangements shall be made to ensure the watertight integrity of the ~~bulkheads~~ boundaries.

2.2 Valves not forming part of a piping system shall not be permitted in watertight ~~bulkheads~~ boundaries.

2.3 Lead or other heat sensitive materials shall not be used in systems which penetrate watertight ~~bulkheads~~ boundaries, where deterioration of such systems in the event of fire would impair the watertight integrity of the ~~bulkheads~~ boundaries.

3 No doors, manholes or access openings are permitted in watertight transverse bulkheads dividing a cargo space from an adjoining cargo space, except as provided in paragraph ~~9~~8.1 and in regulation 14.

4 Subject to paragraph ~~10~~9, not more than one door, apart from the doors to shaft tunnels, may be fitted in each watertight bulkhead within spaces containing the main and auxiliary propulsion machinery including boilers serving the needs of propulsion. Where two or more shafts are fitted, the tunnels shall be connected by an intercommunicating passage. There shall be only one door between the machinery space and the tunnel spaces where two shafts are fitted and only two doors where there are more than two shafts. All these doors shall be of the sliding type and shall be so located as to have their sills as high as practicable. The hand gear for operating these doors from above the bulkhead deck shall be situated outside the spaces containing the machinery.

5.1 Watertight doors, except as provided in paragraph ~~9~~8.1 or regulation 14, shall be power-operated sliding doors complying with the requirements of paragraph ~~7~~6 ~~capable of being closed simultaneously from the central operating console at the navigation bridge in not more than 60 s with the ship in the upright position~~.

5.2 The means of operation whether by power or by hand of any power-operated sliding watertight door shall be capable of closing the door with the ship listed to 15° either way. Consideration shall also be given to the forces which may act on either side of the door as may be experienced when water is flowing through the opening applying a static head equivalent to a water height of at least 1 m above the sill on the centreline of the door.

5.3 Watertight door controls, including hydraulic piping and electric cables, shall be kept as close as practicable to the bulkhead in which the doors are fitted, in order to minimize the likelihood of them being involved in any damage which the ship may sustain. The positioning of watertight doors and their controls shall be such that if the ship sustains damage within one fifth of the breadth of the ship, as defined in regulation 2, such distance being measured at right angles to the centreline at the level of the deepest subdivision draught, the operation of the watertight doors clear of the damaged portion of the ship is not impaired.

~~6 All power-operated sliding watertight doors shall be provided with means of indication which will show at all remote operating positions whether the doors are open or closed. Remote operating positions shall only be at the navigation bridge as required by paragraph 7.1.5 and at the location where hand operation above the bulkhead deck is required by paragraph 7.1.4.~~

~~7~~6.1 Each power-operated sliding watertight door:

.1 shall have a vertical or horizontal motion;

.2 shall, subject to paragraph ~~10~~9, be normally limited to a maximum clear opening width of 1.2 m. The Administration may permit larger doors only to the extent considered necessary for the effective operation of the ship provided that other safety measures, including the following, are taken into consideration:

.2.1 special consideration shall be given to the strength of the door and its closing appliances in order to prevent leakages; and

.2.2 the door shall be located inboard the damage zone *B*/5;

.3 shall be fitted with the necessary equipment to open and close the door using electric power, hydraulic power or any other form of power that is acceptable to the Administration;

.4 shall be provided with an individual hand-operated mechanism. It shall be possible to open and close the door by hand at the door itself from either side, and in addition, close the door from an accessible position above the bulkhead deck with an all-round crank motion or some other movement providing the same degree of safety acceptable to the Administration. Direction of rotation or other movement is to be clearly indicated at all operating positions. The time necessary for the complete closure of the door, when operating by hand gear, shall not exceed 90 s with the ship in the upright position~~;~~. Visual indicators to show whether the door is open or closed shall be provided at the accessible position above the bulkhead deck.

.5 shall be provided with controls for opening and closing the door by power from both sides of the door and also for closing the door by power from the central operating console(s) ~~at the navigation bridge~~ required by paragraph 7.1;

.6 shall be provided with an audible alarm, distinct from any other alarm in the area, which will sound whenever the door is closed remotely by power and which shall sound for at least 5 s but no more than 10 s before the door begins to move and shall continue sounding until the door is completely closed. In the case of remote hand operation it is sufficient for the audible alarm to sound only when the door is moving. Additionally, in passenger areas and areas of high ambient noise the Administration may require the audible alarm to be supplemented by an intermittent visual signal at the door; and

.7 shall have an approximately uniform rate of closure under power. The closure time, from the time the door begins to move to the time it reaches the completely closed position, shall in no case be less than 20 s or more than 40 s with the ship in the upright position.

~~7~~6.2 The electrical power required for power-operated sliding watertight doors shall be supplied from the emergency switchboard either directly or by a dedicated distribution board situated above the bulkhead deck. The associated control, indication and alarm circuits shall be supplied from the emergency switchboard either directly or by a dedicated distribution board situated above the bulkhead deck and be capable of being automatically supplied by the transitional source of emergency electrical power required by regulation 42.3.1.3 in the event of failure of either the main or emergency source of electrical power.

~~7~~6.3 Power-operated sliding watertight doors shall have either:

.1 a centralized hydraulic system with two independent power sources each consisting of a motor and pump capable of simultaneously closing all doors. In addition, there shall be for the whole installation hydraulic accumulators of sufficient capacity to operate all the doors at least three times, i.e. closed-open-closed, against an adverse list of 15º. This operating cycle shall be capable of being carried out when the accumulator is at the pump cut-in pressure. The fluid used shall be chosen considering the temperatures liable to be encountered by the installation during its service. The power-operating system shall be designed to minimize the possibility of having a single failure in the hydraulic piping adversely affect the operation of more than one door. The hydraulic system shall be provided with a low-level alarm for hydraulic fluid reservoirs serving the power-operated system and a low gas pressure alarm or other effective means of monitoring loss of stored energy in hydraulic accumulators. These alarms are to be audible and visual and shall be situated on the central operating console(s) ~~at the navigation bridge~~ required by paragraph 7.1; or

.2 an independent hydraulic system for each door with each power source consisting of a motor and pump capable of opening and closing the door. In addition, there shall be a hydraulic accumulator of sufficient capacity to operate the door at least three times, i.e. closed-open-closed, against an adverse list of 15º. This operating cycle shall be capable of being carried out when the accumulator is at the pump cut-in pressure. The fluid used shall be chosen considering the temperatures liable to be encountered by the

installation during its service. A low gas pressure group alarm or other effective means of monitoring loss of stored energy in hydraulic accumulators shall be provided at the central operating console(s) ~~on the navigation bridge~~ required by paragraph 7.1. Loss of stored energy indication at each local operating position shall also be provided; or

.3 an independent electrical system and motor for each door with each power source consisting of a motor capable of opening and closing the door. The power source shall be capable of being automatically supplied by the transitional source of emergency electrical power as required by regulation 42.4.2 - in the event of failure of either the main or emergency source of electrical power and with sufficient capacity to operate the door at least three times, i.e. closed-open-closed, against an adverse list of 15°.

For the systems specified in paragraphs ~~7~~6.3.1, ~~7~~6.3.2 and ~~7~~6.3.3, provision should be made as follows: Power systems for power-operated watertight sliding doors shall be separate from any other power system. A single failure in the electric or hydraulic power-operated systems excluding the hydraulic actuator shall not prevent the hand operation of any door.

~~7~~6.4 Control handles shall be provided at each side of the bulkhead at a minimum height of 1.6 m above the floor and shall be so arranged as to enable persons passing through the doorway to hold both handles in the open position without being able to set the power closing mechanism in operation accidentally. The direction of movement of the handles in opening and closing the door shall be in the direction of door movement and shall be clearly indicated.

~~7~~6.5 As far as practicable, electrical equipment and components for watertight doors shall be situated above the bulkhead deck and outside hazardous areas and spaces.

~~7~~6.6 The enclosures of electrical components necessarily situated below the bulkhead deck shall provide suitable protection against the ingress of water.*

* Refer to the following publication IEC 60529:2003:

.1 electrical motors, associated circuits and control components; protected to IPX 7 standard;

.2 door position indicators and associated circuit components; protected to IPX 8 standard; and

.3 door movement warning signals; protected to IPX 6 standard.

Other arrangements for the enclosures of electrical components may be fitted provided the Administration is satisfied that an equivalent protection is achieved. The water pressure IPX 8 shall be based on the pressure that may occur at the location of the component during flooding for a period of 36 h.

~~7~~6.7 Electric power, control, indication and alarm circuits shall be protected against fault in such a way that a failure in one door circuit will not cause a failure in any other door circuit. Short circuits or other faults in the alarm or indicator circuits of a door shall not result in a loss of power operation of that door. Arrangements shall be such that leakage of water into the electrical equipment located below the bulkhead deck will not cause the door to open.

~~7~~6.8 A single electrical failure in the power operating or control system of a power-operated sliding watertight door shall not result in a closed door opening. Availability of the power supply should be continuously monitored at a point in the electrical circuit as near as practicable to each of the motors required by paragraph ~~7~~6.3. Loss of any such power supply should activate an audible and visual alarm at the central operating console(s) ~~at the navigation bridge~~ required by paragraph 7.1.

~~8~~7.1 A central operating console for all power-operated sliding watertight doors shall be located in the safety centre in accordance with regulation II-2/23. If the safety centre is located in a separate space adjacent to the navigation bridge, a central operating console shall also be located on the navigation bridge. The central operating console(s) ~~at the navigation bridge~~ shall have a "master mode" switch with two modes of control: a "local control" mode which shall allow any door to be locally opened and locally closed after use without automatic closure, and a "doors closed" mode which shall automatically close any door that is open in not more than 60 s with the ship in an upright position. ~~The "doors closed" mode shall automatically close any door that is open.~~ The "doors closed" mode shall permit doors to be opened locally and shall automatically re-close the doors upon release of the local control mechanism. The "master mode" switch shall normally be in the "local control" mode. The "doors closed" mode shall only be used in an emergency or for testing purposes. ~~Special consideration shall be given to the reliability of the "master mode" switch.~~

~~8~~7.2 For ships subject to the provisions of regulation 1.1.1.1 and constructed before 1 January 2024, t~~T~~he central operating console at the navigation bridge shall be provided with a diagram showing the location of each door, with visual indicators to show whether each door is open or closed. A red light shall indicate a door is fully open and a green light shall indicate a door is fully closed. When the door is closed remotely the red light shall indicate the intermediate position by flashing. The indicating circuit shall be independent of the control circuit for each door.

7.3 For ships constructed on or after 1 January 2024, the central operating console(s) shall be provided with a diagram showing the location of each power-operated sliding watertight door, with visual indicators to show whether each door is open or closed. A red light shall indicate a door is fully open and a green light shall indicate a door is fully closed. When the door is closed remotely the red light shall indicate the intermediate position by flashing. The indicating circuit shall be independent of the control circuit for each door. Indication shall also be provided to the onboard stability computer, if installed in accordance with regulation II-1/8-1.3.1.

~~8~~7.~~3~~4 It shall not be possible to remotely open any door from the central operating console.

~~9~~8.1 If the Administration is satisfied that such doors are essential, watertight doors of satisfactory construction may be fitted in watertight bulkheads dividing cargo ~~between deck~~ spaces on 'tween decks. Such doors may be hinged, rolling or sliding doors but shall not be remotely controlled. They shall be fitted at the highest level and as far from the shell plating as practicable, but in no case shall the outboard vertical edges be situated at a distance from the shell plating which is less than one fifth of the breadth of the ship, as defined in regulation 2, such distance being measured at right angles to the centreline at the level of the deepest subdivision draught.

~~9~~8.2 Should any such doors be accessible during the voyage, they shall be fitted with a device which prevents unauthorized opening. When it is proposed to fit such doors, the number and arrangements shall receive the special consideration of the Administration.

~~10~~9 Portable plates on bulkheads shall not be permitted except in machinery spaces. The Administration may permit not more than one power-operated sliding watertight door ~~in each watertight bulkhead~~ larger than those specified in paragraph ~~7~~6.1.2 to be substituted for these portable plates in each watertight bulkhead, provided these doors are intended to remain closed during navigation except in case of urgent necessity at the discretion of the master. These doors need not meet the requirements of paragraph ~~7~~6.1.4 regarding complete closure by hand-operated gear in 90 s.

1~~1~~0.1 Where trunkways or tunnels for access from crew accommodation to the machinery spaces, for piping, or for any other purpose are carried through watertight bulkheads, they shall be watertight and in accordance with the requirements of regulation 16-1. The access to at least one end of each such tunnel or trunkway, if used as a passage at sea, shall be through a trunk extending watertight to a height sufficient to permit access above the bulkhead deck. The access to the other end of the trunkway or tunnel may be through a watertight door~~ of the type required by its location in the ship~~. Such trunkways or tunnels shall not extend through the first subdivision bulkhead abaft the collision bulkhead.

Note: renumber subsequent paragraphs

Regulation 15
Openings in the shell plating below the bulkhead deck of passenger ships and the freeboard deck of cargo ships

9 For ships subject to the provisions of regulation 1.1.1.1 and constructed before 1 January 2024, ~~G~~gangway, cargo and fuelling ports fitted below the bulkhead deck of passenger ships and the freeboard deck of cargo ships shall be watertight and in no case be so fitted as to have their lowest point below the deepest subdivision draught.

10 For ships constructed on or after 1 January 2024, cargo ports and other similar openings (e.g. gangway and fuelling ports) in the side of ships below the bulkhead deck of passenger ships and the freeboard deck of cargo ships shall be fitted with doors so designed as to ensure the same watertightness and structural integrity as the surrounding shell plating. Unless otherwise granted by the Administration, these openings shall open outwards. The number of such openings shall be the minimum compatible with the design and proper working of the ship. In no case shall these openings be so fitted as to have their lowest point below the deepest subdivision draught.

~~10.1 The inboard opening of each ash-chute, rubbish-chute, etc., shall be fitted with an efficient cover.~~

~~10.2 If the inboard opening is situated below the bulkhead deck of passenger ships and the freeboard deck of cargo ships, the cover shall be watertight and, in addition, an automatic non-return valve shall be fitted in the chute in an easily accessible position above the deepest subdivision draught.~~

Regulation 16
Construction and initial tests of watertight closures

1.1 The design, materials and construction of all watertight closures such as doors, hatches, sidescuttles, gangway and cargo ports, valves~~,~~ and pipes~~, ash-chutes and rubbish-chutes~~ referred to in these regulations shall be to the satisfaction of the Administration.

Regulation 17
Internal watertight integrity of passenger ships above the bulkhead deck

1 For passenger ships subject to the provisions of regulation 1.1.1.1 and constructed before 1 January 2024, ~~T~~the Administration may require that all reasonable and practicable measures shall be taken to limit the entry and spread of water above the bulkhead deck. Such measures may include partial bulkheads or webs. When partial watertight bulkheads and webs are fitted on the bulkhead deck, above or in the immediate vicinity of watertight bulkheads, they shall have watertight shell and bulkhead deck connections so as to restrict the flow of water along the deck when the ship is in a heeled damaged condition. Where the partial

watertight bulkhead does not line up with the bulkhead below, the bulkhead deck between shall be made effectively watertight. Where openings, pipes, scuppers, electric cables etc. are carried through the partial watertight bulkheads or decks within the immersed part of the bulkhead deck, arrangements shall be made to ensure the watertight integrity of the structure above the bulkhead deck.*

* Refer to the Guidance notes on the integrity of flooding boundaries above the bulkhead deck of passenger ships for proper application of regulations II-1/8 and 20, paragraph 1, of SOLAS 1974, as amended (MSC/Circ.541, as may be amended).

2 For ships constructed on or after 1 January 2024, the internal watertight subdivision arrangements to limit the entry and spread of water above the bulkhead deck shall be in accordance with the design arrangements necessary for compliance with the stability requirements in parts B-1, and B-2 if applicable. Where pipes, scuppers, electric cables, etc. are carried through internal watertight boundaries that are immersed at any intermediate or final stage of flooding in damage cases that contribute to the attained subdivision index *A*, arrangements shall be made to ensure their watertight integrity.

3 For ships constructed on or after 1 January 2024, doors in internal watertight subdivision arrangements above the bulkhead deck, and also above the worst intermediate or final stage of flooding waterlines, shall be capable of preventing the passage of water when immersed in the required range of positive stability for any damage cases contributing to the attained subdivision index *A*. These doors may remain open provided they can be remotely closed from the navigation bridge. They shall always be ready to be immediately closed.

Note: renumber subsequent paragraphs

Regulation 17-1
Integrity of the hull and superstructure, damage prevention and control on ro-ro passenger ships

1.1 ~~Subject to the provisions of paragraphs 1.2 and 1.3, a~~All accesses from the ro-ro deck that lead to spaces below the bulkhead deck shall have a lowest point which is not less than 2.5 m above the bulkhead deck, unless the access is covered by the provisions in paragraphs 1.2 or 1.3.

1.2 Where vehicle ramps are installed to give access to spaces below the bulkhead deck, their openings shall be able to be closed weathertight to prevent ingress of water below~~, alarmed and indicated to the navigation bridge~~ and fitted with alarms and open/close indicators on the navigation bridge. The means of closure shall be watertight if the deck is intended as a watertight horizontal boundary under regulation 7-2.6.

1.3 Subject to regulations 23.3 and 23.6, t~~T~~he Administration may permit the fitting of particular accesses to spaces below the bulkhead deck provided they are necessary for the essential working of the ship, e.g. the movement of machinery and stores, and subject to such accesses being made watertight, ~~alarmed and indicated on the navigation bridge~~ fitted with alarms and open/close indicators on the navigation bridge.

PART B-4
STABILITY MANAGEMENT

Regulation 19
*Damage control information**

1 There shall be permanently exhibited, or readily available on the navigation bridge, for the guidance of the officer in charge of the ship, plans showing clearly for each deck and hold the boundaries of the watertight compartments, the openings therein with the means of closure and position of any controls thereof, and the arrangements for the correction of any list due to flooding. In addition, booklets containing the aforementioned information shall be made available to the officers of the ship.

2 General precautions to be included shall consist of a listing of equipment, conditions and operational procedures, considered by the Administration to be necessary to maintain watertight integrity under normal ship operations.

3 Specific precautions to be included shall consist of a listing of elements (i.e. closures, security of cargo, sounding of alarms, etc.) considered by the Administration to be vital to the survival of the ship, passengers and crew.

4 In case of ships to which damage stability requirements of part B-1 apply, damage stability information shall provide the master a simple and easily understandable way of assessing the ship's survivability in all damage cases involving a compartment or group of compartments.

5 For passenger ships constructed on or after 1 January 2024, and to which regulation 8-1.3 applies, the damage control information shall include a reference to activation of damage stability support from the onboard stability computer, if installed, and to shore-based support when provided.

Regulation 21
Periodical operation and inspection of watertight doors, etc., in passenger ships

1 Operational tests of watertight doors, sidescuttles, valves and closing mechanisms of scuppers~~, ash-chutes and rubbish-chutes~~ shall take place weekly. In ships in which the voyage exceeds one week in duration, a complete set of operational tests shall be held before the voyage commences, and others thereafter at least once a week during the voyage.

Regulation 22
Prevention and control of water ingress, etc.

5 Watertight doors fitted in watertight bulkheads dividing cargo ~~between deck~~ spaces on 'tween decks in accordance with regulation 13.~~9~~8.1 shall be closed before the voyage commences and shall be kept closed during navigation. The time at which such doors are opened or closed shall be recorded in such log-book as may be prescribed by the Administration.

6 For ships subject to the provisions of regulation 1.1.1.1 and constructed before 1 January 2024, ~~G~~gangway, cargo and fuelling ports fitted below the bulkhead deck of passenger ships and the freeboard deck of cargo ships shall be effectively closed and secured watertight before the voyage commences, and shall be kept closed during navigation.

7 For ships constructed on or after 1 January 2024, gangway, cargo and fuelling ports fitted below the bulkhead deck of passenger ships and the freeboard deck of cargo ships and all watertight hatches shall be effectively closed and secured watertight before the voyage commences, and shall be kept closed during navigation. However, the master may permit a watertight hatch to be opened during navigation for a limited period of time sufficient to permit passage or for access. It shall then be closed.

Note: renumber subsequent paragraphs.

~~16 When a rubbish-chute, etc. is not in use, both the cover and the valve required by regulation 15.10.2 shall be kept closed and secured.~~

APPENDIX

CHECK/MONITORING SHEET FOR THE DRAFT SOLAS AMENDMENTS (MSC.1/CIRC.1500/REV.1)

Part III – Process monitoring to be completed during the work process at the sub-committee and checked as part of the final approval process by the Committee (refer to paragraph 3.2.1.3)[**]

1	The sub-committee, at an initial engagement, has allocated sufficient time for technical research and discussion before the target completion date, especially on issues needing to be addressed by more than one sub-committee and for which the timing of relevant sub-committees' meetings and exchanges of the result of consideration needed to be carefully examined.	yes
2	The scope of application agreed at the proposal stage was not changed without the approval of the Committee.	yes
3	The technical base document/draft amendment addresses the proposal's issue(s) through the suggested instrument(s); where it does not, the sub-committee offers the Committee an alternative method of addressing the problem raised by the proposal.	NA
4	Due attention has been paid to the *Interim guidelines for the systematic application of the grandfather clauses* (MSC/Circ.765-MEPC/Circ.315).	yes
5	All references have been examined against the text that will be valid if the proposed amendment enters into force.	yes
6	The location of the insertion or modified text is correct for the text that will be valid when the proposed text enters into force on a four-year cycle of entry into force, as other relevant amendments adopted might enter into force on the same date.	yes
7	There are no inconsistencies in respect of scope of application between the technical regulation and the application statement contained in regulation 1 or 2 of the relevant chapter, and application is specifically addressed for existing and/or new ships, as necessary.	yes
8	Where a new term has been introduced into a regulation and a clear definition is necessary, the definition is given in the article of the Convention or at the beginning of the chapter.	yes
9	Where any of the terms "fitted", "provided", "installed" or "installation" are used, consideration has been given to clarifying the intended meaning of the term.	yes

** Part III should be completed by the drafting/working group that prepared the draft text using "yes", "no" or "not applicable". For the draft amendments to be considered and finalized by sub-committees in plenary within one session, the Secretariat may be requested, when necessary, to complete part III of the check/monitoring sheet after the session, instead of establishing a specific working/drafting group. "Minor corrections" (C/ES.27/D, paragraph 3.2(vi)) may be excluded from application of the provisions for completion of the check/monitoring sheet.

10	All necessary related and consequential amendments to other existing instruments, including non-mandatory instruments, in particular to the forms of certificates and records of equipment required in the instrument being amended, have been examined and included as part of the proposed amendment(s).	NA
11	The forms of certificates and records of equipment have been harmonized, where appropriate, between the Convention and its Protocols.	NA
12	It is confirmed that the amendment is being made to a currently valid text and that no other bodies are concurrently proposing changes to the same text.	yes
13	All entry-into-force criteria (building contract, keel laying and delivery) have been considered and addressed.	yes
14	Other impacts of the implementation of the proposed/approved amendment have been fully analysed, including consequential amendments to the "application" and "definition" regulations of the chapter.	yes
15	The amendments presented for adoption clearly indicate changes made with respect to the original text, so as to facilitate their consideration.	yes
16	For amendments to mandatory instruments, the relationship between the Convention and the related instrument has been observed and addressed, as appropriate.	yes
17	The related record format has been completed or updated, as appropriate.	yes

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ANNEX 6

DRAFT ASSEMBLY RESOLUTION

INTERNATIONAL CODE ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF BULK CARRIERS AND OIL TANKERS, 2019 (2019 ESP CODE)

(The text of the draft 2019 ESP Code is contained in document SDC 6/13/Add.1)

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ANNEX 7

DRAFT MSC CIRCULAR

UNIFIED INTERPRETATIONS OF THE 2008 IS CODE*

1 The Maritime Safety Committee, at its ninety-sixth session (11 to 20 May 2016), in order to facilitate global and consistent implementation of requirements of the 2008 Intact Stability Code (IS Code), approved unified interpretations of the 2008 IS Code (MSC.1/Circ.1537), prepared by the Sub-Committee on Ship Design and Construction, at its third session (18 to 22 January 2016)~~, as set out in the annex~~.

2 The Maritime Safety Committee, at its [101st session (5 to 14 June 2019)], agreed to further amend MSC.1/Circ.1537 to include text to the unified interpretations of section 2.3 (Severe wind and rolling criterion (weather criterion), as well as to section 3.4.2 (Assumptions for calculating loading conditions) which has been incorporated in this revised circular.

~~2~~ 3 Member States are invited to apply the annexed unified interpretations and to bring them to the attention of all parties concerned.

* Amended text shown in tracked changes using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.

ANNEX

UNIFIED INTERPRETATIONS OF THE 2008 IS CODE

Introduction

2.23 Definition of the term "lightship"

1 The weight of mediums on board for the fixed fire-fighting systems (e.g. freshwater, CO_2, dry chemical powder, foam concentrate, etc.) should be included in the lightweight and lightship condition.

Part A – Mandatory criteria

2.3 Severe wind and rolling criterion (weather criterion)

2 In applying Φ_f, openings which cannot be or are incapable of being closed weathertight include ventilators (complying with *regulation 19(4) of the International Convention on Load Lines, 1966*) that *for operational reasons have to remain open to supply air to the engine-room, ~~or~~ emergency generator room or closed ro-ro and vehicle spaces (if the same is considered buoyant in the stability calculation or protecting openings leading below) for the effective operation of the ship. Where it is not technically feasible to treat some closed ro-ro and vehicle space ventilators as unprotected openings, Administrations may allow an alternative arrangement that provides an equivalent level of safety.*

Part B – Recommendations for certain types of ships and additional guidelines

3.4.2 Assumptions for calculating loading conditions

3 For tankers assigned with a tropical load line, the ship should be assumed to be loaded ~~to its tropical load line~~ in accordance with the following:

.1 a fully loaded departure condition at the tropical load line and the corresponding arrival loading condition are considered;

.2 the cargo is homogeneously distributed throughout all cargo tanks; and

.3 sea water density is 1.025 t/m^3.

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ANNEX 8

DRAFT MSC CIRCULAR

UNIFIED INTERPRETATIONS RELATING TO THE PROTOCOL OF 1988 RELATING TO THE INTERNATIONAL CONVENTION ON LOAD LINES, 1966*

1 The Maritime Safety Committee, at its ninety-sixth session (11 to 20 May 2016), in order to facilitate global and consistent implementation of requirements concerning sill and coaming heights for openings on top of deckhouses and companionways of the 1988 Load Lines Protocol, approved unified interpretations relating to the Protocol of 1988 relating to the International Convention on Load Lines, 1966 (MSC.1/Circ.1535), prepared by the Sub-Committee on Ship Design and Construction, at its third session (18 to 22 January 2016)~~, as set out in the annex~~.

2 The Maritime Safety Committee, at its [101st session (5 to 14 June 2019)], agreed to further amend MSC.1/Circ.1535 to include text to the unified interpretations of regulation 27(13)(e) of the 1988 Protocol to the International Convention on Load Lines, 1966, which has been incorporated in this revised circular.

~~2~~ 3 Member States are invited to apply the annexed unified interpretations and to bring them to the attention of all parties concerned.

* Amended text shown in tracked changes using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.

ANNEX

UNIFIED INTERPRETATIONS RELATING TO THE PROTOCOL OF 1988 RELATING TO THE INTERNATIONAL CONVENTION ON LOAD LINES, 1966

Regulation 13 – Position of hatchways, doorways and ventilators

1 For the purpose of these regulations, two positions of hatchways, doorways and ventilators are defined as follows:

Position 1 – Upon freeboard decks and raised quarterdecks, or other exposed decks* lower than one standard height of superstructure above the freeboard deck, and upon exposed decks* situated forward of a point located a quarter of the ship's length from the forward perpendicular that are located lower than two standard heights of superstructure above the freeboard deck.

Position 2 – Upon exposed decks* situated abaft a quarter of the ship's length from the forward perpendicular and located at least one standard height of superstructure above the freeboard deck and lower than two standard heights of superstructure above the freeboard deck.

Upon exposed decks* situated forward of a point located a quarter of the ship's length from the forward perpendicular and located at least two standard heights of superstructure above the freeboard deck and lower than three standard heights of superstructure above the freeboard deck.

Regulation 20 – Air pipes

2 Where air pipes to ballast and other tanks extend above:

.1 the freeboard deck; or

.2 other exposed decks* lower than two standard heights of superstructure above the freeboard deck,

the exposed parts of the pipes should be of substantial construction, and the height from the deck to the point where water may have access below should be at least:

.1 760 mm on the freeboard deck or other exposed decks* lower than one standard height of superstructure above the freeboard deck; and

.2 450 mm on other exposed decks* lower than two standard heights of superstructure above freeboard deck.

Note: Flush bolted access covers, which are of substantial construction and are secured by gaskets and closely spaced bolts to maintain water tightness, are not subject to the minimum sill height requirements.

* "Exposed decks" include top decks of superstructures, deckhouses, companionways and other similar deck structures.

Regulation 27 – Types of ships

Regulation 27(13)(e)

3 Unprotected openings include ventilators (complying with regulation 19(4) of the International Convention on Load Lines, 1966) that for operational reasons have to remain open to supply air to the engine-room, ~~or~~ emergency generator room or closed ro-ro and vehicle spaces (if the same is considered buoyant in the stability calculation or protecting openings leading below) for the effective operation of the ship. Where it is not technically feasible to treat some closed ro-ro and vehicle space ventilators as unprotected openings, Administrations may allow an alternative arrangement that provides an equivalent level of safety.

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ANNEX 9

DRAFT MSC CIRCULAR

UNIFIED INTERPRETATIONS OF SOLAS CHAPTER II-1*

1 The Maritime Safety Committee, at its ninety-sixth session (11 to 20 May 2016), in order to facilitate global and consistent implementation of the requirements of SOLAS chapter II-1, approved unified interpretations of SOLAS chapter II-1 (MSC.1/Circ.1539), prepared by the Sub-Committee on Ship Design and Construction, at its third session (18 to 22 January 2016)~~, as set out in the annex~~.

2 The Maritime Safety Committee, at its [101st session (5 to 14 June 2019)], agreed to further amend MSC.1/Circ.1539 to include text to the unified interpretations of SOLAS regulation II-1/7-2 on the calculation of the factor s_i.

~~2~~ 3 Member States are invited to apply the annexed unified interpretations and to bring them to the attention of all parties concerned.

* Amended text shown in tracked changes using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.

ANNEX

UNIFIED INTERPRETATIONS OF SOLAS CHAPTER II-1

Regulation 2.21 – Definition of the term "Lightweight"

1 The weight of mediums on board for the fixed fire-fighting systems (e.g. freshwater, CO_2, dry chemical powder, foam concentrate, etc.) should be included in the lightweight and lightship condition.

Regulation 3-2 – Protective coatings of dedicated seawater ballast tanks in all types of ships and double-side skin spaces of bulk carriers

2 The following tanks should not be considered to be dedicated seawater ballast tanks and should, therefore, be exempted from the application and requirements 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)), provided the coatings applied in the tanks described in sub-paragraphs .2 and .3 below are confirmed by the coating manufacturer to be resistant to the media stored in these tanks and provided such coatings are applied and maintained according to the coating manufacturer's procedures:

.1 ballast tanks identified as "Spaces included in Net Tonnage" in the International Tonnage Certificate (1969);

.2 seawater ballast tanks in passenger ships also designated for the carriage of grey water or black water; and

.3 seawater ballast tanks in livestock carriers also designated for the carriage of livestock dung.

Regulation 7-2 – Calculation of the factor s_i

3 In applying θ_v, openings which cannot be or are incapable of being closed weathertight include ventilators (complying with *regulation 19(4) of the International Convention on Load Lines, 1966)* that *for operational reasons have to remain open to supply air to the engine-room, ~~or~~ emergency generator room or closed ro-ro and vehicle spaces (if the same is considered buoyant in the stability calculation or protecting openings leading below) for the effective operation of the ship. Where it is not technically feasible to treat some closed ro-ro and vehicle space ventilators as unprotected openings, Administrations may allow an alternative arrangement that provides an equivalent level of safety.*

***

ANNEX 10

DRAFT MSC CIRCULAR

UNIFIED INTERPRETATIONS OF SOLAS CHAPTER II-1

1 The Maritime Safety Committee, at its [101st session (5 to 14 June 2019)], agreed to the unified interpretations of SOLAS regulations II-1/22-1 and II-2/21.4.13 on the safe return to port requirement for flooding detection system.

2 Member States are invited to apply the annexed unified interpretations and to bring them to the attention of all parties concerned.

ANNEX

UNIFIED INTERPRETATIONS OF SOLAS CHAPTER II-1

(SOLAS Regulation II-1/22-1 and II-2/21.4.13 (Amendments adopted by resolution MSC.216(82))

Regulation II-1/22-1 – Flooding detection systems for passenger ships carrying 36 or more persons constructed on or after 1 July 2010

"A flooding detection system for watertight spaces below the bulkhead deck shall be provided based on the guidelines developed by the Organization.*

* Refer to *Guidelines for flooding detection systems on passenger ships MSC.1/Circ.1291*)."

Regulation II-2/21.4 – Safe return to port*

"When fire damage does not exceed the casualty threshold indicated in paragraph 3, the ship shall be capable of returning to port while providing a safe area as defined in regulation 3. To be deemed capable of returning to port, the following systems shall remain operational in the remaining part of the ship not affected by fire:

(…)

.13 flooding detection systems; and (...)

* Refer to *Interim Explanatory Notes for the assessment of passenger ship systems' capabilities after a fire or flooding casualty* (MSC.1/Circ.1369 and Add.1)."

***Guidelines for flooding detection systems on passenger ships* (MSC.1/Circ.1291)**

"7 Any watertight spaces that are separately equipped with a liquid level monitoring system (such as fresh water, ballast water, fuel, etc.), with an indicator panel or other means of monitoring at the navigation bridge (and the safety centre if located in a separate space from the navigation bridge), are excluded from these requirements."

Interpretation

For passenger ships carrying 36 or more persons and subject to SOLAS regulation II-1/8-1, the Safe Return To Port (SRTP) requirements of SOLAS regulation II-2/21.4 apply to both:

.1 the flooding detection systems in the spaces as defined in paragraph 6 of MSC.1/Circ.1291; and

.2 the liquid level monitoring systems, which are used as, or replace, the flooding detection systems, as specified in paragraph 7 of MSC.1/Circ.1291.

Therefore, the exemption as given in paragraph 7 of MSC.1/Circ.1291 does not apply in the context of SRTP.

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ANNEX 11

BIENNIAL STATUS REPORT AND OUTPUTS ON THE COMMITTEE'S POST-BIENNIAL AGENDA THAT FALL UNDER THE PURVIEW OF THE SUB-COMMITTEE

Sub-Committee on Ship Design and Construction (SDC)									
Reference to Strategic Direction (SD), if applicable	**Output number**	**Description**	**Target completion year**	**Parent organ(s)**	**Associated organ(s)**	**Coordinating organ**	**Status of output for Year 1**	**Status of output for Year 2**	**References**
1. Improve implementation	1.3 (NEW)	Validated model training courses	Continuous	MSC / MEPC	III / HTW / PPR / CCC / SDC / SSE / NCSR	HTW		In progress	MSC 100/20, paragraphs 10.3 to 10.6 and 17.25
2. Integrate new and advancing technologies in the regulatory framework	2.3	Amendments to the IGF Code and development of guidelines for low-flashpoint fuels	2019	MSC	HTW / PPR / SDC / SSE	CCC	No work requested	No work requested	MSC 94/21, paragraphs 18.5 and 18.6; MSC 96/25, paragraphs 10.1 to 10.3; MSC 97/22, paragraph 19.2
2. Integrate new and advancing technologies in the regulatory framework	2.4	Mandatory instrument and/or provisions addressing safety standards for the carriage of more than 12 industrial personnel on board vessels engaged on international voyages	2020	MSC	SDC		In progress	In progress	MSC 95/22, paragraph 19.25; MSC 96/25, paragraphs 7.10 and 7.12; MSC 97/22, paragraphs 6.22 and 6.23; MSC 99/22, paragraphs 10.17 and 10.18

Sub-Committee on Ship Design and Construction (SDC)									
Reference to Strategic Direction (SD), if applicable	**Output number**	**Description**	**Target completion year**	**Parent organ(s)**	**Associated organ(s)**	**Coordinating organ**	**Status of output for Year 1**	**Status of output for Year 2**	**References**
2. Integrate new and advancing technologies in the regulatory framework	2.6	Finalization of second generation intact stability criteria	2020	MSC	SDC		In progress	In progress	MSC 85/26, paragraphs 12.7 and 23.42; SDC 5/15, section 6; SDC 6/13, section 5
2. Integrate new and advancing technologies in the regulatory framework	2.8	Development of guidelines for cold ironing of ships and of amendments to SOLAS chapters II-1 and II-2, if necessary	2020	MSC	III / HTW / SDC	SSE	No work requested	No work requested	MSC 98/23, paragraph 20.36
Notes:	Description amended and HTW was added as associated organ								
6. Ensure regulatory effectiveness	6.1	Unified interpretation of provisions of IMO safety, security, and environment-related conventions	Continuous	MSC / MEPC	III / PPR / CCC / SDC / SSE / NCSR			Ongoing	MSC 76/23, paragraph 20.3; MSC 78/26, paragraph 22.12; SDC 5/15, section 9; SDC 6/13, section 9
Notes:	A 28 expanded the output to include all proposed unified interpretations to provisions of IMO safety, security, and environment-related conventions								

Sub-Committee on Ship Design and Construction (SDC)									
Reference to Strategic Direction (SD), if applicable	**Output number**	**Description**	**Target completion year**	**Parent organ(s)**	**Associated organ(s)**	**Coordinating organ**	**Status of output for Year 1**	**Status of output for Year 2**	**References**
6. Ensure regulatory effectiveness	6.15	Role of the human element	Continuous	MSC / MEPC	III / PPR / CCC / SDC / SSE / NCSR	HTW	Ongoing	Ongoing	MSC 89/25, paragraphs 10.10, 10.16 and 22.39, and annex 21; MSC 100/20, paragraph 10.8
OW. Other work	OW 2	Amendments to the ESP Code	Continuous	MSC	SDC		Ongoing	Completed	MSC 92/26, paragraph 13.31; SDC 5/15, section 8; SDC 6/13, section 7
OW. Other work	OW 31	Revised SOLAS regulation II-1/3-8 and associated guidelines (MSC.1/Circ.1175) and new guidelines for safe mooring operations for all ships	2019	MSC	HTW / SSE	SDC	In progress	Completed	MSC 95/22, paragraph 19.22; SDC 5/15, section 10 SDC 6/13, section 3
OW. Other work	OW 32	Amendments to SOLAS regulation II-1/8-1 on the availability of passenger ships' electrical power supply in cases of flooding from side raking damage	2019	MSC	SDC		Completed		MSC 85/26, paragraph 23.35; MSC 99/22, paragraphs 10.6 and 20.13.2

Sub-Committee on Ship Design and Construction (SDC)									
Reference to Strategic Direction (SD), if applicable	**Output number**	**Description**	**Target completion year**	**Parent organ(s)**	**Associated organ(s)**	**Coordinating organ**	**Status of output for Year 1**	**Status of output for Year 2**	**References**
OW. Other work	OW 36	Review SOLAS chapter II-2 and associated codes to minimize the incidence and consequences of fires on ro-ro spaces and special category spaces of new and existing ro-ro passenger ships	2019	MSC	HTW / SDC	SSE	No work requested	No work requested	MSC 97/22, paragraph 19.19; MSC 98/23, paragraph 12.42
OW. Other work	OW 37	Revised SOLAS regulations II-1/13 and II-1/13-1 and other related regulations for new ships	2019	MSC	SDC	SSE	No work requested	No work requested	MSC 95/22, paragraphs 19.20 and 19.32; MSC 98/23, annex 38
OW. Other work	OW 38	Guidelines for wing-in-ground craft	2019	MSC	SDC		Completed		MSC 99/22, paragraph 10.21
OW. Other work	OW 40	Safety measures for non-SOLAS ships operating in polar waters	2021	MSC	SDC			In progress	MSC 98/23, paragraphs 10.29, 20.31.1 and 20.31.2, and annex 38; MSC 99/22, paragraphs 7.16 and 20.13.1; SDC 6/13, section 8

Sub-Committee on Ship Design and Construction (SDC)									
Reference to Strategic Direction (SD), if applicable	**Output number**	**Description**	**Target completion year**	**Parent organ(s)**	**Associated organ(s)**	**Coordinating organ**	**Status of output for Year 1**	**Status of output for Year 2**	**References**
OW. Other work	OW 41	Review SOLAS chapter II-1, parts B-2 to B-4, to ensure consistency with parts B and B-1 with regard to watertight integrity	2020	MSC	SDC		In progress	In progress	MSC 96/25, paragraph 23.23; SDC 5/15, section 5; SDC 6/13, section 4
Note:	Consequential work on this output is required, i.e. amendments to the Explanatory Notes in resolution MSC.429(98); see also proposed change to the output title								
OW. Other work	OW 43	Consequential work related to the new International Code for Ships Operating in Polar Waters	2019	MSC	SSE / NCSR	SDC		In progress	MSC 93/22, paragraphs 10.44, 10.50 and 20.12; MSC 96/25, paragraph 3.77; MSC 97/22, paragraphs 8.32 and 19.25
OW. Other work	OW 46	Computerized stability support for the master in case of flooding for existing passenger ships	2018	MSC	SDC		Completed		MSC 94/21, paragraph 18.20; MSC 99/22, paragraphs 3.12, 3.81.6, 10.7 and 10.8; SDC 5/15, section 4

OUTPUTS ON THE COMMITTEE'S POST-BIENNIAL AGENDA THAT FALL UNDER THE PURVIEW OF THE SUB-COMMITTEE

SHIP DESIGN AND CONSTRUCTION (SDC)								
ACCEPTED POST-BIENNIAL OUTPUTS				Parent organ(s)	Associated organ(s)	Coordinating organ	Timescale (sessions)	Reference
Number	Biennium	Reference to Strategic Direction (SD), if applicable	Description					
152	2016-2017	SD 2 (Integrate new and advancing technologies in the regulatory framework)	Guidelines for use of Fibre Reinforced Plastics (FRP) within ship structures	MSC	SDC		2	MSC 98/23, paragraph 10.22
7	2012-2013	Other work	Mandatory application of the Performance standard for protective coatings for void spaces on bulk carriers and oil tankers	MSC	SDC		2	MSC 76/23, paragraphs 20.41.2 and 20.48; DE 50/27, section 4
8	2012-2013	Other work	Performance standard for protective coatings for void spaces on all types of ships	MSC	SDC		2	MSC 76/23, paragraphs 20.41.2 and 20.48
32	2012-2013	Other work	Recommendations related to navigational sonar on crude oil tankers	MSC / MEPC	SDC		1	MSC 91/22, paragraph 19.23

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ANNEX 12

PROPOSED BIENNIAL AGENDA FOR THE 2020-2021 BIENNIUM*

Reference to SD, if applicable	Output number	Description	Parent organ(s)	Associated organ(s)	Coordinating organ	Target completion year
1. Improve implementation	1.3 (NEW)	Validated model training courses	MSC / MEPC	III / HTW / PPR / CCC / SDC / SSE / NCSR	HTW	Continuous
2. Integrate new and advancing technologies in the regulatory framework	2.3	Amendments to the IGF Code and development of guidelines for low-flashpoint fuels	MSC	HTW / PPR / SDC / SSE	CCC	2019
2. Integrate new and advancing technologies in the regulatory framework	2.4	Mandatory instrument and/or provisions addressing safety standards for the carriage of more than 12 industrial personnel on board vessels engaged on international voyages	MSC	SDC		2020
2. Integrate new and advancing technologies in the regulatory framework	2.6	Finalization of second generation intact stability criteria	MSC	SDC		2021**

* Amended text shown in tracked changes using "strikeout" for deleted text and "grey shading" to highlight new insertions.

** While finalization of the draft Guidelines on second generation intact stability criteria is to be concluded at SDC 7, the amendments to the associated Explanatory Notes for Second Generation Intact Stability Criteria was agreed to be finalized at SDC 8.

Reference to SD, if applicable	Output number	Description	Parent organ(s)	Associated organ(s)	Coordinating organ	Target completion year
2. Integrate new and advancing technologies in the regulatory framework	2.8	Development of guidelines for cold ironing of ships and of amendments to SOLAS chapters II-1 and II-2, if necessary	MSC	III / HTW / SDC	SSE	2020
Notes:	Description amended and HTW was added as associated organ					
6. Ensure regulatory effectiveness	6.1	Unified interpretation of provisions of IMO safety, security, and environment-related conventions	MSC / MEPC	III / PPR / CCC / SDC / SSE / NCSR		Continuous
Notes:	A 28 expanded the output to include all proposed unified interpretations to provisions of IMO safety, security, and environment-related conventions					
6. Ensure regulatory effectiveness	6.15	Role of the human element	MSC / MEPC	III / PPR / CCC / SDC / SSE / NCSR	HTW	Continuous
~~OW. Other work~~	~~OW 2~~	~~Amendments to the ESP Code~~	~~MSC~~	~~SDC~~		~~Continuous~~
~~OW. Other work~~	~~OW 31~~	~~Revised SOLAS regulation II-1/3-8 and associated guidelines (MSC.1/Circ.1175) and new guidelines for safe mooring operations for all ships~~	~~MSC~~	~~HTW / SSE~~	~~SDC~~	~~2019~~
~~OW. Other work~~	~~OW 32~~	~~Amendments to SOLAS regulation II-1/8-1 on the availability of passenger ships' electrical power supply in cases of flooding from side raking damage~~	~~MSC~~	~~SDC~~		~~2019~~

Reference to SD, if applicable	Output number	Description	Parent organ(s)	Associated organ(s)	Coordinating organ	Target completion year
OW. Other work	OW 36	Review SOLAS chapter II-2 and associated codes to minimize the incidence and consequences of fires on ro-ro spaces and special category spaces of new and existing ro-ro passenger ships	MSC	HTW / SDC	SSE	2019
OW. Other work	OW 37	Revised SOLAS regulations II-1/13 and II-1/13-1 and other related regulations for new ships	MSC	SDC	SSE	2019
~~OW. Other work~~	~~OW 38~~	~~Guidelines for wing-in-ground craft~~	~~MSC~~	~~SDC~~		~~2019~~
OW. Other work	OW 40	Safety measures for non-SOLAS ships operating in polar waters	MSC	SDC		2021
OW. Other work	OW 41	Amendments to the Explanatory Notes to SOLAS chapter II-1 subdivision and damage stability regulations (resolution MSC.429(98)) ~~Review SOLAS chapter II-1, parts B-2 to B-4, to ensure consistency with parts B and B-1 with regard to watertight integrity~~	MSC	SDC		2020
Note:	Note change of title of output to reflect consequential work on the associated Explanatory Notes to SOLAS chapter II-1 subdivision and damage stability regulations (resolution MSC.429(98)) after completion of the draft amendments to SOLAS chapter II-1, parts B-1 to B-4 to ensure consistency with parts B and B-1 with regard to watertight integrity					
OW. Other work	OW 43	Consequential work related to the new International Code for Ships Operating in Polar Waters	MSC	SSE / NCSR	SDC	~~2019~~ 2021
~~OW. Other work~~	~~OW 46~~	~~Computerized stability support for the master in case of flooding for existing passenger ships~~	~~MSC~~	~~SDC~~		~~2018~~

Reference to SD, if applicable	Output number	Description	Parent organ(s)	Associated organ(s)	Coordinating organ	Target completion year
OW. Other work	[…]	Development of amendments to SOLAS chapter II-1 to include requirements for water level detectors on non-bulk carrier cargo ships with multiple cargo holds	MSC	SDC		2021
OW. Other work	[…]	Mandatory application of the Performance standard for protective coatings for void spaces on bulk carriers and oil tankers	MSC		SDC	2021
Note:	Ref.: MSC 76/23, paragraphs 20.41.2 and 20.48; DE 50/27, section 4					
OW. Other work	[…]	Performance standard for protective coatings for void spaces on all types of ships	MSC		SDC	2021
Note:	Ref.: MSC 76/23, paragraphs 20.41.2 and 20.48					
OW. Other work	[…]	Recommendations related to navigational sonar on crude oil tankers	MSC/ MEPC		SDC	2020

OUTPUTS TO REMAIN ON THE COMMITTEE'S POST-BIENNIAL AGENDA THAT FALL UNDER THE PURVIEW OF THE SUB-COMMITTEE

SHIP DESIGN AND CONSTRUCTION (SDC)								
ACCEPTED POST-BIENNIAL OUTPUTS				Parent organ(s)	Associated organ(s)	Coordinating organ	Timescale (sessions)	Reference
Number	Biennium	Reference to Strategic Direction (SD), if applicable	Description					
152	2016-2017	SD 2 (Integrate new and advancing technologies in the regulatory framework)	Guidelines for use of Fibre Reinforced Plastics (FRP) within ship structures	MSC	SDC		2	MSC 98/23, paragraph 10.22
~~7~~	~~2012-2013~~	~~Other work~~	~~Mandatory application of the Performance standard for protective coatings for void spaces on bulk carriers and oil tankers~~	~~MSC~~	~~SDC~~		~~2~~	~~MSC 76/23, paragraphs 20.41.2 and 20.48; DE 50/27, section 4~~
~~8~~	~~2012-2013~~	~~Other work~~	~~Performance standard for protective coatings for void spaces on all types of ships~~	~~MSC~~	~~SDC~~		~~2~~	~~MSC 76/23, paragraphs 20.41.2 and 20.48~~
32	2012-2013	Other work	Recommendations related to navigational sonar on crude oil tankers	MSC / MEPC	SDC		1	MSC 91/22, paragraph 19.23

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ANNEX 13

PROPOSED PROVISIONAL AGENDA FOR SDC 7

Opening of the session

1 Adoption of the agenda

2 Decisions of other IMO bodies

3 Amendments to the Explanatory Notes (resolution MSC.429(98))[1] (OW 41)

4 Safety measures for non-SOLAS ships operating in polar waters (OW 40)

5 Finalization of second generation intact stability criteria (2.6)

6 Mandatory instrument and/or provisions addressing safety standards for the carriage of more than 12 industrial personnel on board vessels engaged on international voyages (2.4)

7 Development of amendments to SOLAS chapter II-1 to include requirements for water level detectors on non-bulk carrier cargo ships with multiple cargo holds[2]

8 Mandatory application of the Performance standard for protective coatings for void spaces on bulk carriers and oil tankers (OW 7)

9 Performance standard for protective coatings for void spaces on all types of ships (OW 8)

[10 Recommendations related to navigational sonar on crude oil tankers (OW 32)]

11 Unified interpretation to provisions of IMO safety, security, and environment-related conventions (6.1)

12 Biennial status report and provisional agenda for SDC 8

13 Election of Chair and Vice-Chair for 2021

14 Any other business

15 Report to the Maritime Safety Committee

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[1] Renaming of the output subject to approval by MSC 101.

[2] Output number to be assigned by the Council in due course.

ANNEX 14

DRAFT MSC CIRCULAR*

GUIDELINES FOR WING-IN-GROUND CRAFT

1 The Maritime Safety Committee, at its seventy-sixth session (2 to 13 December 2002), approved the *Interim Guidelines for wing-in-ground (WIG) craft* (MSC/Circ.1054 and Corr.1) with the intention to be used with proper engineering analysis, design and developmental testing to achieve an inherently safe craft, and agreed their relevancy and adequacy should be assessed as experience is gained in their application.

2 The Maritime Safety Committee, at its seventy-ninth session (1 to 10 December 2004), approved the *Amendments to the Interim Guidelines for Wing-in-ground (WIG) Craft* (MSC/Circ.1126) regarding the date of completion of the survey on which the Wing-in-ground Craft Safety Certificate is based.

3 The Maritime Safety Committee, at its eighty-ninth session (11 to 20 May 2011), instructed the Sub-Committee on Ship Design and Equipment, in conjunction with other relevant sub-committees, to review the *Interim Guidelines for wing-in-ground (WIG) craft* (MSC/Circ.1054 and Corr.1), as amended (MSC/Circ.1126), and submit the reviewed Guidelines to the Committee for approval.

4 The Maritime Safety Committee, at its ninety-ninth session (16 to 25 May 2018), having considered a proposal by the Sub-Committee on Ship Design and Construction at its fifth session, approved the *Guidelines for wing-in-ground craft* (MSC.1/Circ.1592~~, as set out in the annex~~.

5 The Maritime Safety Committee, at its [101st session (5 to 14 June 2019)], agreed to update obsolete references in MSC.1/Circ.1592, as set out in this revised circular.

~~5~~ 6 Member States are invited to bring the annexed Guidelines to the attention of all parties concerned.

~~6~~ 7 This circular revokes MSC/Circ.1054 and Corr.1, and MSC/Circ.1126.

* Amended text shown in tracked changes using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.

ANNEX

GUIDELINES FOR WING-IN-GROUND CRAFT[†]

1 The reference to MSC/Circ.373/Rev.1 in the footnote in paragraph 9.2.4.8 of the annex is replaced by "MSC/Circ.677".

2 In the Record of equipment for wing-in-ground craft safety certificate in paragraph 2.2 of annex 1, under "2 Details of life-saving appliances", the current reference to "SOLAS regulation III/44" is replaced by "chapter 4.5 of the LSA Code".

3 In the Record of equipment for wing-in-ground craft safety certificate in paragraph 2.3 of annex 1, under "2 Details of life-saving appliances", the current reference to "SOLAS regulation III/44" is replaced by "chapter 4.6 of the LSA Code".

4 In the Record of equipment for wing-in-ground craft safety certificate in paragraph 4 of annex 1, under "2 Details of life-saving appliances", the current reference to “SOLAS regulations III/38 to 40” is replaced by "chapters 4.1 to 4.3 of the LSA Code".

5 The reference to SOLAS regulation III/39 in paragraphs 2.7 and 3.3 of annex 7 on Open reversible liferafts is replaced by "chapter 4.2 of the LSA Code".

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[†] The full text of MSC.1/Circ.1592/Rev.1 is not reproduced here due to the minor character of the changes.

ANNEX 15

STATEMENTS BY DELEGATIONS

AGENDA ITEM 6 – Statement by the delegation of Australia

"Australia would like to express its appreciation for the good work done by the Correspondence Group and particularly Norway for coordinating the group.

SOLAS regulation I/2(e) defines passenger as "every person who is not a master or a member of the crew or any other person employed or engaged in any capacity on board a ship on the business of that ship". In the draft SOLAS chapter XV (annexed to SDC 6/6/1), regulation 1.3, industrial personnel is defined as, "all persons who are transported or accommodated on board for the purpose of offshore industrial activities performed on board other vessels and/or other offshore facilities". This is in clear conflict with SOLAS because according to this definition industrial personnel are not "employed or engaged in any capacity on board a ship on the business of that ship". To be consistent with SOLAS, persons merely "transported or accommodated" on board a ship must be passengers on that ship. However, the interim recommendations approved by the Committee in resolution MSC.418(97) says, "such industrial personnel should not be considered or treated as passengers under SOLAS regulation I/2(e)". Therefore, the SOLAS definition; the MSC resolution; and current work of the correspondence group are in conflict. The Sub-Committee must carefully consider this problem for a pragmatic resolution.

The 1983 and 2008 SPS Codes defined "special personnel" consistent with the SOLAS wording "employed or engaged on board in any capacity on board a ship on the business of that ship" clearly excluding them from "passengers". Paragraph 1.2.3 of the 2008 SPS Code states that "the Code is not intended for ships used to transport and accommodate industrial personnel that are not working on board". This was included because to do otherwise would contravene the SOLAS definition of "passenger".

Australia will continue its support for the current work to deem "industrial personnel" to be excluded from the SOLAS definition of "passenger". Australia is committed to contribute in developing the mandatory instruments to their completion. At the same time, however, Australia would like to ensure that the work does not result in the safety standards applicable to special personnel and special purpose ships being different from; or less enforceable than for industrial personnel and industrial personnel ships respectively.

Australia would find it very unsatisfactory if the conflicts highlighted above were to be given effect by an MSC resolution. It seems highly improper that the IP Code, which deals with personnel merely "transported and accommodated", is made mandatory whereas the SPS Codes remains voluntary despite the personnel in question were clearly accepted in IMO instruments as "employed or engaged on board in any capacity on board a ship on the business of that ship".

Australia believes, for an acceptable solution, the 2008 SPS Code could easily be folded into the IP Code by deeming industrial personnel to include special personnel as defined in the 2008 SPS Code. However, Australia appreciates that covering special personnel by the IP Code is beyond the current terms of reference of the work. Therefore, with the support of the Sub-Committee, Australia would like to seek the Committee's agreement and/or approval at MSC 101 to modify the scope of the work in this regard as necessary. This will allow the Sub-Committee to consider a solution acceptable to all."

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