INTERNATIONAL MARITIME ORGANIZATION

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SUB-COMMITTEE ON SHIP DESIGN AND CONSTRUCTION
9th session
Agenda item 16

SDC 9/16
13 March 2023
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# REPORT TO THE MARITIME SAFETY COMMITTEE

**LIST OF ANNEXES**

## 1 GENERAL

1.1 The Sub-Committee on Ship Design and Construction (SDC), chaired by Mr. E. Tvedt (Denmark), held its ninth session from 23 to 27 January 2023. The Vice-Chair, Mr. J. Sirkar (United States), was also present.

1.2 The session was attended by delegations from Member States and Associate Members of IMO, representatives from United Nations and specialized agencies, and observers from intergovernmental organizations and non-governmental organizations in consultative status, as listed in document SDC 9/INF.1.

### Opening address

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

### 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.

### Use of hybrid meeting capabilities

1.5 The Sub-Committee noted that the plenary sessions would be conducted in hybrid mode (see also paragraph 15.21), i.e. remote participation enabled, taking into account the relevant decisions of C 127 (C 127/D, paragraph 17.3).

1.6 In this regard, the Sub-Committee noted that C 127 had:

.1 agreed to the use of hybrid facilities to complement in-person meetings from September 2022, for a trial period of one year;

.2 agreed that the rules of procedure and the *Interim guidance to facilitate remote sessions of the Committees during the COVID-19 pandemic* (MSC-LEG-MEPC-TCC-FAL.1/Circ.1), as appropriate, should be applied and that only representatives of the Members attending the meeting in person at IMO Headquarters would be allowed to vote; and

.3 invited other organs of the Organization to follow the above decisions and to report to a future session of the Council on their experience with hybrid meetings.

1.7 In this context, the Sub-Committee recalled that, as per Article 30 of the IMO Convention, which states that the Committee shall adopt its own rules of procedure and in line with the decisions of the Council and MSC 106, the Sub-Committee agreed that:

.1 as per the current rules of procedure of the Committee and the *Interim guidance for remote sessions* adopted by the Committee at the ALCOM meeting in September 2020, for this hybrid session, a Member State will be considered "present" for the purposes of rule of procedure 28(1) if they are either physically present in the meeting hall or are registered and participating remotely online using the hybrid system; and

.2 voting by secret ballot will take place in person only.

**Update on the revised Organization and Committees' method of work (MSC-MEPC.1/Circ.5/Rev.4)**

1.8 The Sub-Committee noted that MSC 106 and MEPC 79 had concurrently approved the fourth revision of the *Organization and method of work of the Maritime Safety Committee and the Marine Environment Protection Committee and their subsidiary bodies* (MSC-MEPC.1/Circ.5/Rev.4), which provides a five working day commenting period for delegations from the day of the publication of the final draft report, limited to editorial corrections and improvements, including finalizing individual statements, and that such comments should not reopen discussion on decisions taken during the session (see also paragraph 16.2).

1.9 In addition to the above, the Sub-Committee noted that MSC-MEPC.1/Circ.5/Rev.4 included a revised paragraph 6.3, which states that documents should not be introduced in plenary unless the Chair decides that this is essential for the proper consideration of the matter concerned. However, the revised method of work allows submitters of documents to indicate before or at the time the document is considered if they have additional information or context required for the discussions, in order for the Chair to prioritize interventions.

**Adoption of the agenda and related matters**

1.10 The Sub-Committee adopted the agenda for the meeting (SDC 9/1) and agreed to be guided in its work, in general, by the annotations contained in document SDC 9/1/1 (Secretariat) and the arrangements in document SDC 9/1/2 (Chair).

## 2 DECISIONS OF OTHER IMO BODIES

2.1 The Sub-Committee noted the outcome of PPR 8, MSC 105, MSC 106, MEPC 78, C 127 and MEPC 79 relevant to its work, as reported in document SDC 9/2 (Secretariat) and under agenda item 1 (see paragraphs 1.5 to 1.9) and took action under the relevant agenda items.

## 3 SAFETY MEASURES FOR NON-SOLAS SHIPS OPERATING IN POLAR WATERS

**General**

3.1 The Sub-Committee recalled that the outstanding work under this agenda item was the development of Guidelines for the following two types of vessels operating in polar waters: (1) pleasure yachts of 300 gross tonnage and upwards but less than 500 gross tonnage engaged in trade (i.e. commercial yachts); and (2) cargo ships of 300 gross tonnage and upwards and less than 500 gross tonnage.

3.2 The Sub-Committee also recalled that SDC 8, owing to time constraints and in the absence of any submissions under this agenda item, had decided to invite proposals for the development of safety measures for commercial yachts and/or cargo ships below 500 gross tonnage to SDC 9.

3.3 Not having received any submissions to SDC 8 and this session, the Sub-Committee recalled the Committee's method of work (MSC-MEPC.1/Circ.5/Rev.4, paragraph 5.12), which provides that sub-committees should seek the advice of the Committees in the case of outputs for which no submissions have been received for two consecutive sessions.

**Further work on the output**

3.4 The Sub-Committee noted the following views in response to the possible completion of the output:

.1 the lack of an instrument for commercial yachts and for non-SOLAS cargo vessels of less than 500 gross tonnage operating in polar waters was concerning and, therefore, the Sub-Committee should continue the work on this output;

.2 one of the reasons for not progressing the matter was a lack of data for smaller vessels operating in polar waters; such data was currently collected, for consideration at SDC 10; and

.3 with the loss of polar ice, increasing numbers of smaller vessels were entering polar waters with crews of little polar experience.

3.5 Recognizing the importance of establishing a robust regime for all vessels entering polar waters, while also noting the lack of data on traffic of smaller vessels in polar waters, the Sub-Committee agreed to place this output on the post-biennial agenda to allow more time for collecting relevant information so that work could resume in the future, without the need for a new output proposal (refer to paragraph 13.3 and annex 14).

## 4 FURTHER DEVELOPMENT OF THE IP CODE AND ASSOCIATED GUIDANCE

4.1 The Sub-Committee recalled that MSC 106 had adopted new SOLAS chapter XV (Safety measures for ships carrying industrial personnel) and the new International Code of Safety for Ships Carrying Industrial Personnel (IP Code) by resolutions MSC.521(106) and MSC.527(106), respectively, for entry into force on 1 July 2024 (MSC 106/19, paragraphs 3.41 and 3.52).

4.2 The Sub-Committee also recalled that MSC 106, in conjunction with the adoption of the aforementioned instruments on the safety for ships carrying industrial personnel, had instructed the Sub-Committee to consider the harmonization of the expressions "ships carrying more than" and "the ship is certified to carry more than" in part IV of the draft IP Code when undertaking further work under this output (MSC 106/19, paragraph 3.54).

4.3 The Sub-Committee recalled further that MSC 105, after having considered the need for future work on SOLAS chapter XV and the IP Code, had agreed to a second phase of work under this output to address outstanding matters, including clarifying the interaction between the IP and SPS Codes, incorporating provisions for passenger ships and, with respect to high-speed craft carrying IP, provisions for sleeping berths and for high-speed craft carrying more than 60 persons (MSC 105/20, paragraph 15.8).

4.4 In connection with the above, the Sub-Committee also recalled that SDC 8 had, inter alia, considered the need to amend the SPS Code to address the perceived ambiguity in the application of the IP and SPS Codes and had agreed that (SDC 8/18, paragraph 4.8.1):

.1 Explanatory Notes could be developed after finalization of SOLAS chapter XV and the IP Code, which could clarify the interaction between the two Codes and the different categories of persons on board; and

.2 proposals on amendments to the SPS Codes could also be submitted to SDC 9.

4.5 In addressing the further development of the IP Code and associated guidance, the Sub-Committee noted the information contained in the following documents:

.1 SDC 9/INF.3 (IMCA), providing IMCA's submission on the IP Code Guidance, developed after IMCA had sought clarification on several key issues from flag Administrations, and which could be of assistance to the Sub-Committee in developing a guidance document or Explanatory Notes as part of the second phase of its work on the IP Code; and

.2 SDC 9/INF.6 (China), providing relevant experience of transferring industrial personnel from a high-speed passenger ship, which could be used as a reference for the Sub-Committee's subsequent development of IP Code amendments and associated guidelines.

4.6 Subsequently, the Sub-Committee:

.1 invited interested delegations to liaise with IMCA with a view to developing a first draft of the Explanatory Notes, taking document SDC 9/INF.3 into account and addressing any other outstanding issues (see paragraph 4.3), for submission to SDC 10; and

.2 agreed to take the information provided in document SDC 9/INF.6 into account when addressing passenger ship provisions in the IP Code, or related guidance thereto.

4.7 The Sub-Committee also agreed to invite the Committee to extend the target completion year for this output to 2025, so as to allow for two sessions to complete the work (see paragraph 13.5 and annex 15).

## 5 REVIEW OF THE 2014 GUIDELINES FOR THE REDUCTION OF UNDERWATER NOISE FROM COMMERCIAL SHIPPING TO ADDRESS ADVERSE IMPACTS ON MARINE LIFE (MEPC.1/CIRC.833) (2014 GUIDELINES) AND IDENTIFICATION OF NEXT STEPS

### General

5.1 The Sub-Committee recalled that SDC 8 had agreed to the *Work plan for the review of the 2014 Guidelines for the reduction of underwater noise and identification of next steps* (SDC 8/18, paragraph 14.23 and annex 11), which was noted by MSC 105 and MEPC 78 (MSC 105/20, paragraph 15.23 and MEPC 78/17, paragraph 10.3, respectively).

5.2 The Sub-Committee also recalled that SDC 8 had established a Correspondence Group on Review of the Guidelines for the Reduction of Underwater Noise (MEPC.1/Circ.833) to, inter alia, further develop amendments to the 2014 Guidelines and to consider next steps (SDC 8/18, paragraph 14.28).

5.3 With respect to the request of MEPC 76 to the Secretariat to discuss with potential donors, such as GEF, regarding the potential funding of a global underwater vessel noise project (MEPC 76/15, paragraph 12.3), the Sub-Committee was advised that the Organization's Department of Partnerships and Projects would commence a two-year GEF-UNDP-IMO project called the Global Partnership for Mitigation of Underwater Noise from Shipping (GloNoise Partnership) later in 2023, which was aligned with the current work on the review of the *Guidelines for the reduction of underwater noise* (MEPC.1/Circ.833) and the consideration of next steps.

**Report of the Correspondence Group**

5.4 The Sub-Committee considered the report of the Correspondence Group on the Review of the Underwater Noise Guidelines (SDC 9/5), containing the draft revised Guidelines, as well as additional information for their further development to increase awareness, uptake and implementation and outlining the next steps.

5.5 In connection with the above, the Sub-Committee noted the information in document SDC 9/INF.2 (Canada), containing the comments received in the final round of consideration of the Correspondence Group that could not be considered in its report due to time constraints.

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

.1 SDC 9/5/2 (Brazil), highlighting that it was premature to analyse items listed in annex 7 on suggested next steps, as well as questioning the development of underwater radiated noise (URN) measures beyond the technical expertise of the Sub-Committee, in particular the impact of proposed URN measures vis-à-vis energy efficiency or on policy matters for URN reduction;

.2 SDC 9/5/3 (Inuit Circumpolar Council), proposing to include a stand-alone section/annex in the Guidelines related to Inuit Nunaat (Inuit Homeland) and operations in the Arctic and identifying next steps to be considered to further prevent and reduce URN impacts from shipping;

.3 SDC 9/5/4 (Japan), proposing to modify section 5 (Underwater Noise Management Planning) of the draft revised Guidelines to consider a reduction of shaft speed or power output of the main engine in a protected area as an acceptable speed reduction measure to minimize URN;

.4 SDC 9/5/5 (Japan, Liberia and CLIA), proposing to implement the Revised Guidelines on a trial basis to identify whether the provisions were practicable and effective, in particular on noise management;

.5 SDC 9/5/6 (China), proposing to set goals and baselines according to ship types and sizes and to identify and describe only main noise sources instead of all noise sources in the Underwater Noise Management Planning; and

.6 SDC 9/5/7 (FOEI, WWF, IFAW, Pacific Environment and CSC), proposing a range of provisions for inclusion in the Guidelines, such as setting URN targets for classes of ships depending on their speed or tonnage, as well as proposing that a specialist workshop be held to advance work the proposed Underwater Noise Management Planning Integrated Tool.

5.7 In connection with the above, the Sub-Committee also noted the information provided in the following documents:

.1 SDC 9/INF.9 (Republic of Korea), highlighting the problems of identifying and monitoring URN from ships using the current measurement standard and introduces the URN monitoring technology being developed in the Republic of Korea, which measured noise and vibration signals on board;

.2 SDC 9/INF.10 (Japan), providing the results of the underwater sound measurements conducted in the water south of Izu-Oshima Island, Japan from 2020 to 2022 using a monitoring station; and

.3 SDC 9/INF.11 (Japan), highlighting that changes in propeller design did not contribute significantly to URN reduction but constituted a trade-off with GHG reduction measures; therefore, speed reduction would be a more efficient measure to reduce URN.

5.8 In the ensuing discussion, the Sub-Committee noted the following views:

.1 the draft revised 2014 Guidelines should have a generic application and provide flexibility so that they could be applied for specific areas;

.2 the draft revised 2014 Guidelines should have a provision clearly stating their non-mandatory character;

.3 a number of uncertainties existed in relation to the revised 2014 Guidelines: how to measure the levels of URN emitted from ships; how to quantify acceptable URN limits; whether they should be applied universally or in certain geographical regions only; whether compliance should be achieved through ship design or by operational measures or both; and how to ensure that ships' URN compliance did not adversely affect GHG emissions;

.4 the revised 2014 Guidelines should take into account different sizes and types of ships and could contain provisions which were specific for certain particularly sensitive sea areas;

.5 further assessments and research were needed to develop measures for reducing URN, including their impact on GHG emissions and the marine ecosystem; and

.6 based on an Arctic Council report from 2021, underwater noise from shipping in the Arctic Ocean had doubled in just six years and, accordingly, there was a need to develop mandatory measures within a programme of action as next steps, to ensure noise levels and impacts on marine life in Inuit Nunaat, and globally, were significantly reduced.

5.9 Taking into account the above views, the Sub-Committee agreed to the following:

.1 the Revised guidelines for the reduction of underwater noise should not contain any provision stating that they were non-mandatory as it was well understood that all IMO guidance was non-mandatory, and adding text to that effect would set a precedence and would have unintended consequences;

.2 the decision to develop a mandatory instrument on the reduction of URN from ships was the responsibility of MEPC; and

.3 notwithstanding the above, the recommendation to MEPC to develop a mandatory instrument might be considered as part of the proposed next step.

5.10 Taking into account the above views, the Sub-Committee agreed to instruct the Working Group on Review of the Guidelines for the Reduction of Underwater Noise (MEPC.1/Circ.833) to consider the various proposals in detail and advise the Sub-Committee accordingly.

**Consideration of the next steps and updated work plan**

5.11 With respect to the proposals received in the above-mentioned documents relating to the next steps, including those in document SDC 9/5/1 (Canada), the Sub-Committee agreed that these needed further consideration in the Working Group.

5.12 Subsequently, the Sub-Committee agreed to instruct the Working Group to review and finalize the updated work plan, using the annex to document SDC 9/5/1 as the basis, for subsequent consideration by the Sub-Committee.

**Establishment of the Working Group**

5.13 Having considered the above matters, the Sub-Committee established the Working Group on Review of the Guidelines for the Reduction of Underwater Noise (MEPC.1/Circ.833) and instructed it, taking into account the comments and decisions made in plenary, as well as documents SDC 9/5/2, SDC 9/5/3, SDC 9/5/4, SDC 9/5/5, SDC 9/5/6, SDC 9/5/7, SDC 9/INF.2, SDC 9/INF.9, SDC 9/INF.10 and SDC 9/INF.11, to:

.1 finalize the draft revised guidelines for the reduction of underwater noise from shipping to address adverse impacts on marine life, based on annex 1 to document SDC 9/5, incorporating, as appropriate, provisions for the Noise Management Planning Integrated Tool (SDC 9/5, annex 2) and on energy efficiency compliance measures and URN relationships (SDC 9/5, annex 3);

.2 finalize and prioritize the work plan to further prevent and reduce URN from shipping, based on the annex to document SDC 9/5/1; and

.3 finalize and prioritize the list of provisional suggestions to promote the work of the Organization to increase awareness, uptake and implementation of the Guidelines, and the provisional list of suggested next steps to further prevent and reduce URN from shipping, based on annex 7 to document SDC 9/5, and formulate recommendations for next steps, taking into account annexes 4 to 6 to document SDC 9/5.

**Report of the Working Group**

5.14 Having considered the report of the Working Group (SDC 9/WP.3), the Sub-Committee approved it in general and took action as outlined below.

***Finalization of the Revised guidelines for the reduction of underwater radiated noise from shipping***

5.15 In considering the draft revised guidelines for the reduction of underwater radiated noise from shipping (SDC 9/WP.3, annex 1), the Sub-Committee noted a statement of the observer of the Inuit Circumpolar Council, highlighting that noise pollution from ships had a unique and significant impact in Arctic marine waters with disproportionally higher adverse effects compared to other regions; therefore, the inclusion of provisions related to Indigenous Knowledge in the draft Revised Guidelines was welcome.

5.16 Having considered the report of the Working Group (SDC 9/WP.3), the Sub-Committee:

.1 noted the discussion of the Group on how the information related to the "national and international designated protected areas" could be collected by the Organization for the purposes of the draft Revised Guidelines;

.2 noted the Group's agreement that the Revised Guidelines could be applied to any ship, except warships and naval auxiliaries or when noise was introduced deliberately by sources other than shipping (paragraph 8);

.3 noted the draft guidelines for underwater radiated noise reduction in Inuit Nunaat and the Arctic, with a view to being utilized in the future by interested parties (annex 2);

.4 noted the draft responsibility assignment matrix with regard to URN reduction (annex 3); and

.5 agreed to the draft revised guidelines for the reduction of underwater radiated noise from shipping to address impacts on marine life (see paragraph 5.17 and annex 1).

5.17 Having considered the above matters, the Sub-Committee invited MEPC 80 to:

.1 approve the draft MEPC circular on revised guidelines for the reduction of underwater radiated noise from shipping to address adverse impacts on marine life, as set out in annex 1;

.2 endorse the updated work plan for the continued work on URN, as set out in annex 2, and note the draft guidelines in regard to the Inuit Nunaat and the Arctic, with a view to possibly issuing a separate circular (SDC 9/WP.3, annex 2);

.3 approve the convening of an expert workshop on the relationship between energy efficiency and underwater noise, with the participation of relevant experts (SDC 9/WP.3, annex 4 (outcome 3)); and

.4 encourage interested Member States and international organizations to submit lessons learned/best practices in the implementation of the Revised Guidelines by MEPC 85, including outreach and awareness efforts to support uptake, with a view to identifying necessary revisions to the Revised Guidelines, as appropriate (SDC 9/WP.3, annex 4 (Measures/actions 2)).

**Re-establishment of the correspondence group**

5.18 Having agreed, in line with the updated work plan (annex 2), that the work on the output should be continued intersessionally to continue the remaining work on identifying ways to implement the Revised Guidelines and promote the work of the Organization (next steps), the Sub-Committee re-established the Correspondence Group on Review of the Guidelines for the Reduction of Underwater Noise (MEPC.1/Circ.833), under the coordination of Canada,[1] and instructed it to:

.1 revise the flow chart on the URN Noise Management Planning process in the annex to document SDC 9/INF.2 to reflect the Revised Guidelines and appendix 3, to be used as a tool for raising awareness of the Revised Guidelines;

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.2 finalize and prioritize the provisional list of suggested next steps to further prevent and reduce underwater radiated noise from ships, based on annexes 4 to 7 of document SDC 9/5; and

.3 submit a written report to SDC 10.

## 6 AMENDMENTS TO THE 2011 ESP CODE

6.1 The Sub-Committee recalled that MSC 106 had adopted amendments to parts A and B of annexes A and B of the 2011 ESP Code, prepared by SDC 8 in accordance with the procedure for undertaking regular updates of the Code agreed by MSC 92, which exempts regular updates to the 2011 ESP Code from the four-year cycle for entry into force of SOLAS amendments (MSC 92/26, paragraph 13.31).

### Modifications to the Procedures for approval and certification of a firm engaged in thickness measurement of hull structures

6.2 The Sub-Committee considered document SDC 9/6 (China), proposing to modify the Procedures for approval and certification of a firm engaged in thickness measurement of hull structures, so as to permit Administrations to exercise the right to audit a firm conducting thickness measurement of hull structures.

6.3 Following consideration, the Sub-Committee agreed to a draft MSC resolution on Amendments to the International Code on the Enhanced Programme of Inspections during Surveys of Bulk Carriers and Oil Tankers, 2011 (2011 ESP Code), as set out in annex 3, for submission to MSC 107 for approval and subsequent adoption.

## 7 SAFETY OBJECTIVES AND FUNCTIONAL REQUIREMENTS OF THE GUIDELINES ON ALTERNATIVE DESIGN AND ARRANGEMENTS FOR SOLAS CHAPTER II-1

7.1 The Sub-Committee recalled that SDC 8 had endorsed the time frame for further development of goals, functional requirements and expected performances for SOLAS chapter II-1, parts C, D and E (SDC 8/WP.6, paragraph 20) with the aim of amending the *Revised guidelines on alternative design and arrangements for SOLAS chapters II-1 and III* (MSC.1/Circ.1212/Rev.1).

### Report of the Correspondence Group

7.2 The Sub-Committee considered the report of the Correspondence Group on Safety Objectives and Functional Requirements for SOLAS chapter II-1 (SDC 9/7), providing information on the progress made in updating the tables set out in annex 3 to document SDC 8/9 (System description and Identified Hazard Sheet for part D), as well as on the development of the goal, functional requirements and expected performances for parts C and E of SOLAS chapter II-1.

7.3 The Sub-Committee also considered document SDC 9/7/1 (IACS), commenting on the report of the Correspondence Group and proposing the identification of failure mode(s) and hazards addressed by the existing prescriptive regulations for part C of SOLAS chapter II-1 in order to meet their intent or rationale when developing the FRs and EPs for alternative design criteria.

7.4 Subsequently, the Sub-Committee considered the actions requested in paragraph 19 of document SDC 9/7 and, having approved the report in general, took the following decisions:

.1 endorsed the tables on system description and identified hazard sheet for SOLAS chapter II-1, part D, which were important for the development of functional requirements but would not be included in the Revised Guidelines;

.2 agreed to conduct the failure mode/hazard identification addressed by the regulations of SOLAS chapter II-1, part C and part E, as proposed in document SDC 9/7/1;

.3 agreed to the draft goal, as well as the draft functional requirements and expected performances of SOLAS chapter II-1, part C (SDC 9/7, annex 2 and 3, respectively);

.4 agreed that functional requirements and expected performances of regulations II-1/28, II-1/29 and II-1/30 (steering and propulsion) should be considered under the post-biennial agenda for output on "Revision of SOLAS chapters II-1 (part C) and V and related instruments regarding steering and propulsion requirements to address both traditional and non-traditional propulsion and steering systems" (SDC 9/7, annex 4); and

.5 noted the preliminary draft goal, functional requirements and expected performances of SOLAS chapter II-1, part E (SDC 9/7, annex 5).

7.5 With respect to its decision in paragraph 7.4.4, the Sub-Committee noted that, regardless of the work to be undertaken by the SSE Sub-Committee on the new output on the revision of SOLAS chapters II-1 (part C) and V and related instruments regarding steering and propulsion requirements, there was a need to provide for alternative arrangements for the current regulations II-1/28, II-1/29 and II-1/30.

7.6 Following on from the above, the Sub-Committee requested the Working Group to finalize the draft functional requirements and expected performances for part C of SOLAS chapter II-1, including regulations II-1/28, II-1/29 and II-1/30.

7.7 Consequently, the Sub-Committee invited the SSE Sub-Committee to take annex 4 of document SDC 9/7 into account when commencing the work on the above new output (see paragraph 7.4.4). The Committee was invited to endorse this recommendation.

**Establishment of the Working Group**

7.8 Having considered the above matters, the Sub-Committee established the Working Group on Safety Objectives and Functional Requirements for SOLAS chapter II-1 and instructed it, taking into account the comments and decisions made in plenary, to:

.1 identify failure modes/hazards for finalizing the goal, functional requirements and expected performances for part C of SOLAS chapter II-1, similar to the tables in annex 1 to document SDC 9/7;

.2 finalize the draft goal, functional requirements and expected performances of SOLAS chapter II-1, part C, based on document SDC 9/7, annexes 2 and 3, respectively, for inclusion as a separate appendix to the Revised Guidelines (MSC.1/Circ.1212/Rev.1), taking into account the outcome of the failure modes/hazards identification in .1 and annex 4 to document SDC 9/7, as appropriate;

.3 identify failure modes/hazards for finalizing the goal, functional requirements and expected performances for part E of SOLAS chapter II-1, similar to the tables in annex 1 to document SDC 9/7;

.4 further develop the draft goal, functional requirements and expected performances of SOLAS chapter II-1, part E, based on annex 5, taking into account the outcome of the hazard identification in .3, for inclusion as a separate appendix to the Revised Guidelines (MSC.1/Circ.1212/Rev.1); and

.5 consider whether the Correspondence Group should be re-established to progress the work and, if so, prepare draft terms of reference for consideration by the Sub-Committee.

**Report of the Working Group**

7.9 Having considered the report of the Working Group (SDC 9/WP.4), the Sub-Committee took action as outlined below:

.1 agreed, in principle, to the outcome of failure modes/hazards identification for SOLAS chapter II-1, parts C and E (paragraphs 4 to 15 and annexes 1 and 2);

.2 endorsed the view of the Group that the presentation format of the goals, functional requirements and expected performances for SOLAS chapter II-1, parts C and E, should follow the same format used for SOLAS chapter III in appendix 5 to the Revised Guidelines (MSC.1/Circ.1212/Rev.1) (paragraph 16);

.3 endorsed the view of the Group that the goals, functional requirements and expected performances for SOLAS chapter II-1, parts C, D and E, should be presented separately, but described in the same appendix to the Revised Guidelines (MSC.1/Circ.1212/Rev.1) (paragraph 17); and

.4 agreed, in principle, to the goals for SOLAS chapter II-1, parts C and E (paragraphs 18, 19 and 22 and annexes 3 and 4).

7.10 The Sub-Committee noted the discussion of the Working Group on whether the gender-neutral term ''continuously attended'', instead of "manned'', should be used in the goal for SOLAS chapter II-1, part E, although the current regulations in SOLAS chapter II-1, part E, used the term "manned" (SDC 9/WP.4, paragraph 23 and annex 4)

7.11 In connection with the above, the Sub-Committee noted that the Working Group had discussed gender-neutral terminology only in the context of Guidelines on alternative design and arrangements for SOLAS chapters II-1 and III and agreed to invite the Committee to consider the use of the term "manned", or derivations thereof, holistically as it cut across several mandatory IMO instruments.

**Re-establishment of the correspondence group**

7.12 In order to progress the work intersessionally, the Sub-Committee re-established the Correspondence Group on Safety Objectives and Functional Requirements for SOLAS chapter II-1, under the coordination of Japan,[2] and instructed it to:

.1 review and finalize the failure modes/hazards provided in annexes 1 and 2 to document SDC 9/WP.4;

.2 finalize the draft goal, functional requirements and expected performances of SOLAS chapter II-1, part C, using annexes 3 and 4, as appropriate, to document SDC 9/7, taking into account the outcome of failure modes/hazards identification in annex 1 to document SDC 9/WP.4, and following the format used for SOLAS chapter III in Revised Guidelines (MSC.1/Circ.1212/Rev.1), appendix 5;

.3 finalize the draft goal, functional requirements and expected performances of SOLAS chapter II-1, part E, using annex 5 to document SDC 9/7 as the basis and taking into account the outcome of failure modes/hazards identification in annex 2 to document SDC 9/WP.4, and following the format used for SOLAS chapter III in the Revised Guidelines (MSC.1/Circ.1212/Rev.1), appendix 5;

.4 prepare the draft text for SOLAS chapter II-1, parts C, D and E, to the Revised Guidelines (MSC.1/Circ.1212/Rev.1); and

.5 submit a written report to SDC 10.

## 8 REVISION OF THE 1979, 1989 AND 2009 MODU CODES AND ASSOCIATED MSC CIRCULARS TO PROHIBIT THE USE OF MATERIALS CONTAINING ASBESTOS, INCLUDING CONTROL OF STORAGE OF SUCH MATERIALS ON BOARD

8.1 The Sub-Committee recalled that SDC 8 had established an intersessional Correspondence Group on Revision of the 1979, 1989 and 2009 MODU Codes in order to finalize amendments to the 2009, 1989 and 1979 MODU Codes for the prohibition of materials which contain asbestos on board MODUs, as well as a draft unified interpretation on the matter.

8.2 The Sub-Committee also recalled that MSC 105 had noted that the Secretariat was designated as the Coordinator of the Correspondence Group (MSC 105/20, paragraph 15.32).

**Report of the Correspondence Group**

8.3 The Sub-Committee considered the report of the Correspondence Group on the Revision of the 1979, 1989 and 2009 MODU Codes (SDC 9/8), containing draft amendments to the 2009, 1989 and 1979 MODU Codes to prohibit the use of materials containing asbestos, as well as an associated draft unified interpretation.

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8.4 Having approved the report in general, the Sub-Committee considered the actions requested in paragraph 19 of document SDC 9/8 and took the following decisions.

***Draft amendments to the 1979, 1989 and 2009 MODU Codes***

8.5 Having agreed to delete the reference to SOLAS regulation II-1/3-5 in draft paragraph 2.10.3 in annex 1 to document SDC 9/8, the Sub-Committee discussed a suitable entry-into-force date for the draft amendments to the 1979, 1989 and 2009 MODU Codes and agreed that they should enter into effect on 1 January 2024.

8.6 Subsequently, the Sub-Committee agreed to the draft amendments to the 1979, 1989 and 2009 MODU Codes, to prohibit materials which contain asbestos, including the respective associated draft MSC resolutions, as set out in annexes 4, 5 and 6, respectively, for submission to MSC 107 for adoption.

***Unified interpretation of the amendments to the 1979, 1989 and 2009 MODU Codes***

8.7 In considering the draft unified interpretations for paragraph 2.10.3 of the 2009 MODU Code, paragraph 2.8.2 of the 1989 MODU Code and paragraph 2.7.2 of the 1979 MODU Code (SDC 9/8, annex 4), the Sub-Committee noted the following views:

.1 sub-paragraph 1.3 of the draft unified interpretation did not provide for a time limit for storing asbestos-containing materials on board; it should therefore be included and three years would be appropriate;

.2 it could be inferred from sub-paragraph 1.3 that the existing asbestos-containing inventories on board (consumables, stores, spare parts etc.) could be used until exhausted and until the MODU Code amendments entered into effect, which would be in contradiction to draft sub-paragraph 1.2; and

.3 if text of a unified interpretation did not provide clarity, it should not be included.

8.8 Subsequently, the Sub-Committee agreed to the draft MSC circular on unified interpretation on implementation of regulation 2.10.3 of the 2009 MODU Code, regulation 2.8.2 of the 1989 MODU Code and regulation 2.7.2 of the 1979 MODU Code, as set out in annex 7, for submission to MSC 107 for approval.

***Guidelines for maintenance and monitoring of materials containing asbestos***

8.9 The Sub-Committee also agreed to the draft MSC circular on guidelines for maintenance and monitoring of materials containing asbestos on board MODUs, as set out in annex 8, for submission to MSC 107 for approval.

**Completion of the output**

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

## 9 DEVELOPMENT OF AMENDMENTS TO SOLAS REGULATION II-1/3-4 TO APPLY REQUIREMENTS FOR EMERGENCY TOWING EQUIPMENT FOR TANKERS TO OTHER TYPES OF SHIPS

### General

9.1 The Sub-Committee recalled that MSC 103 had agreed that the requirements for towing equipment for tankers in SOLAS regulation II-1/3-4 should also apply to all types of larger new ships, whereby the tonnage threshold was left in square brackets for consideration by the Sub-Committee with a view to subsequently advising the Committee (MSC 103/21, paragraph 18.16).

9.2 The Sub-Committee also recalled that SDC 8, due to lack of time and bearing in mind that MSC 103 had agreed that the amended regulation II-1/3-4 should enter into force on 1 January 2028, had postponed consideration of this matter to SDC 9 and had referred documents SDC 8/12 (China) and SDC 8/12/1 (Australia et al.) to this session.

9.3 The Sub-Committee further recalled that SDC 8 had invited interested delegations to liaise with, and provide comments to, the co-sponsors of the aforementioned documents with a view to submitting any comments and proposals to SDC 9 (SDC 8/18, paragraph 12.5).

### Draft amendments to SOLAS regulation II-1/3-4 (Emergency towing arrangements and procedures)

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

.1 SDC 8/12 (China), proposing to amend SOLAS regulation II-1/3-4 by adding a requirement for emergency towing arrangements on new ships other than tankers of not less than 150,000 gross tonnage;

.2 SDC 8/12/1 (Australia et al.), proposing to amend SOLAS regulation II-1/3-4 by adding a requirement for emergency towing arrangements on all ships other than tankers of 20,000 gross tonnage and above; and

.3 SDC 9/9 (Austria et al.), providing a comment received by the contact point following the invitation of SDC 8 for interested delegations to liaise with, and provide comments to, the submitters of documents SDC 8/12 and SDC 8/12/1.

9.5 In connection with the above, the Sub-Committee noted the information provided in document SDC 9/INF.4 (United States), providing summaries of 346 incidents recorded in the United States regarding vessels that had experienced a loss of propulsion or steering while under way, analysed by ship size.

9.6 In the ensuing discussion, the Sub-Committee noted the following views:

.1 a threshold of 20,000 gross tonnage for the application of emergency towing arrangements should be applied, as supported by the incident statistic in document SDC 9/INF.4;

.2 the tonnage threshold should be decided in parallel with the work on developing guidance for all ships, based on the existing guidance for tankers in resolution MSC.35(63);

.3 a uniform tonnage threshold regardless of the ship type should not be decided, bearing in mind that some ships were designed such that emergency towing arrangements might not be accommodated; and

.4 any decision on a tonnage threshold should take into account different ship designs and operational profiles; for example, pre-rigging emergency towing gear prior to leaving port might not be appropriate for cruise ships which had a higher frequency of port calls than many tankers and cargo ships.

9.7 Following discussion and considering that a large majority expressed support for the proposal in document SDC 8/12/1, the Sub-Committee agreed to a threshold value of 20,000 GT and upwards for new ships requiring emergency towing arrangements.

***Consideration of exemptions to ships with redundant propulsion systems***

9.8 The Sub-Committee considered whether or not ships with redundant propulsion systems should be excluded from the requirements for emergency towing equipment.

9.9 Having noted the views of delegations which stated that redundancies, such as the safe return capabilities on passenger ships, might still lead to blackouts and that, in addition to propulsion loss, emergency towing might also be needed in cases of steering gear failure or loss of fuel supply, the Sub-Committee agreed that no exemptions should be incorporated for ships with redundant propulsion systems.

9.10 Subsequently, the Sub-Committee agreed to instruct the Experts Group to finalize the draft amendments to SOLAS regulation II-1/3-4, based on the decision reported in the preceding paragraphs.

**Consequential amendments to the Guidelines on emergency towing arrangements for tankers (resolution MSC.35(63), as amended)**

9.11 Having considered document SDC 8/12/1 (Australia et al.), proposing, inter alia, to amend the *Guidelines on emergency towing arrangements for tankers* (resolution MSC.35(63), as amended) so as to extend the application of the Guidelines to ships other than tankers, the Sub-Committee recalled that such work was not covered under the existing output and would need the Committee's approval before commencing such work.

9.12 Having agreed on the need to amend the Guidelines, to address all types of ships covered by the draft new regulation on emergency towing arrangements, the Sub-Committee instructed the Experts Group to prepare an appropriate justification to expand the output and identify the provisions in the Guidelines that would require amendments in order to make them applicable to all types of ships meeting the size threshold, for consideration by MSC 107.

**Establishment of the Experts Group**

9.13 Having considered the above matters, the Sub-Committee established the Experts Group on Application of Emergency Towing Equipment for Tankers to Other Types of Ships and instructed it, taking into account the comments and decisions made in plenary, to:

.1 finalize the draft amendments to SOLAS regulation II-1/3-4, based on document SDC 8/12/1;

.2 prepare part III of the annex to MSC.1/Circ.1500/Rev.2 (monitoring sheet) for inclusion in the Sub-Committee's final report; and

.3 prepare justification to expand the output and identify the provisions in the *Guidelines on emergency towing arrangements for tankers* (resolution MSC.35(63), as amended) which would require amendments in order to be applicable to all types of ships meeting the size threshold.

**Report of the Experts Group**

9.14 Having considered the report of the Experts Group (SDC 9/WP.5), the Sub-Committee agreed to draft amendments to SOLAS regulation II-1/3-4, which included new requirements for all new ships other than tankers of not less than 20,000 GT to be fitted with emergency towing arrangements, for approval by MSC 107 with a view to subsequent adoption, together with the associated check/monitoring sheet and the Record format, as set out in annex 9.

9.15 Having noted the Group's deliberations on the need for further work, the Sub-Committee endorsed the following justification for the expansion of the output:

.1 In the process of developing an amendment to SOLAS regulation II-1/3-4, under output "Development of amendments to SOLAS regulation II-1/3-4 to apply requirements for emergency towing equipment for tankers to other types of ships", wherein a new section containing dedicated requirement for ships other than tankers was created, there emerged the need for developing a separate set of guidelines applicable to ships other than tankers, similar to resolution MSC.35(63), as amended. New design and operational requirements for ships other than tankers should be carefully considered and developed, taking into account differences in ship design, profiles and operational capabilities.

.2 The SDC Sub-Committee should be requested, under the expanded scope of the output with a target completion year of 2025, to also embark on a new task to develop a complete new set of guidelines on emergency towing arrangements on new ships other than tankers, based on, or as a revision of, resolution MSC.35(63), as amended, as well as consequential amendments to the existing guidelines on tankers. Consequentially, the *Revised guidance on shipboard towing and mooring equipment* (MSC.1/Circ.1175/Rev.1) would also need some conforming amendments when the new provisions for ships other than tankers were implemented.

9.16 Having endorsed the expansion of the output, the Sub-Committee agreed to recommend to the Committee the development of a new set of guidelines for emergency towing arrangements on new ships other than tankers, as well as consequential amendments to the existing guidelines for tankers (SDC 9/WP.5, paragraphs 11 to 13).

9.17 In connection with the above, the delegation of India proposed that, if the human element were considered in the future work of the Sub-Committee on emergency towing equipment and arrangements, then this should be in the form of human-centred design; in addition, the competency requirements for operating such equipment and applying towing procedures should be included in the minimum competency requirements for masters and chief mates in the KUP table of section A-II/2 of the STCW Code (see also paragraph 15.14).

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

### General

10.1 The Sub-Committee recalled that this was a continuous item on the Sub-Committee's 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.

### Interpretation on mooring arrangements and equipment (SOLAS regulation II-1/3-8)

10.2 The Sub-Committee considered document SDC 9/10 (IACS), proposing an interpretation for the newly amended SOLAS regulation II-1/3-8 (Towing and mooring equipment), expected to enter into force on 1 January 2024, to clarify the documentation which was necessary to support an Administration or a recognized organization (RO) in verifying compliance with the regulation.

10.3 In the ensuing discussion, the Sub-Committee noted the following views:

.1 while the draft unified interpretation was welcome and provided the necessary clarification, the format should be that of a guidance instrument rather than a unified interpretation;

.2 the information provided in document SDC 9/10 should be made available to the III Sub-Committee in connection with its work on the update of the HSSC Survey Guidelines;

.3 some text in the draft interpretation appeared to exceed the requirements in SOLAS regulation II-1/3-8 and resembled a requirement rather than guidance; and

.4 some editorial changes were needed to address inconsistencies.

10.4 Having agreed to the draft unified interpretation of SOLAS regulation II-1/3-8 in principle, the Sub-Committee instructed the Drafting Group on Unified Interpretations to consider the text in detail with a view to finalization.

10.5 The Sub-Committee also agreed to invite the III Sub-Committee to consider document SDC 9/10 in connection with its work on the update of the HSSC Survey Guidelines.

### Clarification of penetrations in watertight divisions – pressure testing after a fire test (SOLAS regulation II-1/13)

10.6 The Sub-Committee considered document SDC 9/10/1 (IACS), responding to the discussion at SDC 8 and proposing an interpretation of SOLAS regulation II-1/13, clarifying that heat-sensitive piping systems penetrating a watertight bulkhead or deck on a passenger ship should be tested and be type approved for watertight integrity after the fire test, as per the Explanatory Notes to SOLAS regulation II-1/13.2.3.4 (resolution MSC.429(98)/Rev.1 or Rev.2, as applicable).

10.7 In addition, the observer of IACS advised the Sub-Committee that the proposal in document SDC 9/10/1 took into account the decisions made by SDC 8 on two of the three issues raised by IACS in its previous submission on the matter (SDC 8/18, paragraph 10.25), and for the remaining issue IACS was of the view that without testing requirements for bulkhead penetrations in cargo ships prototype testing was only applicable to penetrations installed on passenger ships.

10.8 Having agreed to the draft unified interpretation of SOLAS regulation II-1/13 (Openings in watertight bulkheads below the bulkhead deck in passenger ships), in principle, while noting that some further editorial work was required, the Sub-Committee instructed the Drafting Group on Unified Interpretations to consider the text in detail with a view to finalization.

**Draft interpretation of amendments of SOLAS chapter II-1 adopted by resolutions MSC.474(102) and MSC.482(103)**

10.9 The Sub-Committee considered document SDC 9/10/2 (IACS), proposing an interpretation for the expressions "ships constructed before 1 January 2024" and "multiple hold cargo ships other than bulk carriers and tankers constructed on or after 1 January 2024" in SOLAS chapter II-1.

10.10 In the ensuing discussion, the Sub-Committee noted the following views:

.1 the draft interpretation should be supported as it provided clarity, in particular with regard to the upcoming entry into force of amendments to SOLAS regulation II-1/1.1.3 on 1 January 2024; and

.2 while the interpretation might be superfluous for those familiar with the application requirements in SOLAS, some uncertainty existed among industry for ships with a contract placed before 1 January 2024 but with a keel-laying date between 1 January 2024 and 1 July 2024;

10.11 Consequently, the Sub-Committee agreed to the draft MSC circular on unified interpretation of SOLAS regulation II-1/1.1.3, as set out in annex 10, for submission to MSC 107 for approval.

10.12 In connection with the above, the Sub-Committee invited interested delegations to consider providing illustrative timeline presentations of the application dates as a means to better convey the seemingly rather complex application cycle following the three-day format over consecutive four-year cycles.

**Proposed revision of the unified interpretations of the 2008 IS Code**

10.13 The Sub-Committee considered document SDC 9/10/3 (United States and IACS), proposing a revision of the unified interpretations of the 2008 Intact Stability Code (MSC.1/Circ.1537/Rev.1) for the interpretation of down-flooding point so as to realign the scope of their application to all criteria addressed by the 2008 Intact Stability Code.

10.14 Having considered the proposal, one delegation sought clarification on whether the newly agreed unified interpretation, upon entry into effect, would have an impact on existing ships.

10.15 In response to the above question, the following was stated by the observer of IACS:

.1 it was customary that, when the Committee agreed to a unified interpretation and disseminated it as an MSC circular, it did not usually include an application date and Administrations might apply them as they saw fit;

.2 while it remained unknown what the particular draft amendment might entail and how it was interpreted when MSC.1/Circ.1537 was first approved, IACS believed that the proposed change would not have an effect on ships since IACS specified application criteria for its unified interpretation, as a follow-up on the unified interpretations approved by the Committee; and

.3 IACS had applied the interpretation for the entire 2008 IS Code since 2017, as it was originally intended, i.e. without limiting the application of the interpretation of the specific down-flooding points to the Severe wind and rolling criterion (weather criterion)) in part A, 2.3 of the 2008 Intact Stability Code.

10.16 Consequently, the Sub-Committee agreed to the draft MSC circular on unified interpretations of the 2008 IS Code (MSC.1/Circ.1537/Rev.1), as set out in annex 11, for submission to MSC 107 for approval and dissemination as MSC.1/Circ.1537/Rev.2.

**Proposal for unified interpretation of SOLAS regulation II-2/4.2.2.3.2**

10.17 The Sub-Committee considered document SDC 9/10/4 (China), proposing a unified interpretation for SOLAS regulation II-2/4.2.2.3.2 to clarify the requirements for free-standing oil fuel tanks.

10.18 In considering the proposal, the Sub-Committee recalled that matters concerning SOLAS chapter II-2 were primarily dealt with by the SSE Sub-Committee, but under the terms of reference for the SDC Sub-Committee, as contained in annex 40 to document MSC 92/26, SOLAS chapter II-2 was the responsibility of this Sub-Committee as far as ship construction and materials were concerned.

10.19 In the ensuing discussion, the Sub-Committee noted the following views:

.1 SOLAS regulation II-2/4.2.2.3.2 was unambiguous in its application and the draft unified interpretation exceeded the requirements of the regulation and, therefore, was not supported;

.2 the draft unified interpretation could be considered as a draft amendment to SOLAS rather than an interpretation of the existing requirements; and

.3 the case addressed in the draft unified interpretation concerned only special cases and concerned only a few ships and lacked proper justification.

10.20 Having considered the above views, the Sub-Committee did not agree to the proposed unified interpretation contained in document SDC 9/10/4.

**Establishment of the Drafting Group**

10.21 Following consideration of the above matters, the Sub-Committee established a Drafting Group on Unified Interpretations and instructed it, taking into account the comments made and decisions taken in plenary, to:

.1 finalize the draft unified interpretation on mooring arrangement and equipment (SOLAS regulation II-1/3-8), based on document SDC 9/10; and

.2 finalize the draft unified interpretation on SOLAS regulation II-1/13, clarifying penetrations in watertight divisions for pressure testing after a fire test, based on document SDC 9/10/1.

**Report of the Drafting Group**

10.22 Having considered the report of the Drafting Group (SDC 9/WP.6), the Sub-Committee took action as outlined below.

10.23 The Sub-Committee agreed to the draft revised MSC circular on unified interpretation of SOLAS chapter II-1 (MSC.1/Circ.1362/Rev.1), containing the following new draft unified interpretations:

.1 SOLAS regulation II-1/3-8 on mooring arrangement and equipment to clarify the documentation which was necessary to support an Administration or a recognized organization in verifying compliance with SOLAS regulation II-1/3-8; and

.2 SOLAS regulation II-1/13.2.3 to provide clarification for pressure testing of penetrations in watertight divisions after a fire test,

as set out in annex 12, for submission to MSC 107 for approval and dissemination as MSC.1/Circ.1362/Rev.2.

## 11 REVISION OF THE INTERIM EXPLANATORY NOTES FOR THE ASSESSMENT OF PASSENGER SHIP SYSTEMS' CAPABILITIES AFTER A FIRE OR FLOODING CASUALTY (MSC.1/CIRC.1369) AND RELATED CIRCULARS

**General**

11.1 The Sub-Committee recalled that MSC 103 had agreed to include in its post-biennial agenda an output on "Revision of the Interim explanatory notes for the assessment of passenger ship systems' capabilities after a fire or flooding casualty (MSC.1/Circ.1369) and related circulars", with two sessions needed to complete the item, assigning the SDC Sub-Committee as the coordinating organ, in association with the SSE and HTW Sub-Committees.

11.2 The Sub-Committee also recalled that SDC 8, owing to time constraints, had postponed consideration and moved this output onto the provisional agenda for SDC 9, as agreed by MSC 105 (MSC 105/20, paragraphs 15.24.2 and 18.54).

**Review of Interim Explanatory Notes (MSC.1/Circ.1369)**

11.3 The Sub-Committee considered document SDC 9/11 (China), highlighting that the safe return to port requirements were interpreted differently by flag States and classification societies and, in light of recent developments in technology and design, China proposed the review of MSC.1/Circ.1369 and MSC.1/Circ.1369/Add.1 from three aspects: single voyage exceeding safe return to port (SRtP)-range, challenges of crew operation and the use of gases or low-flashpoint fuel.

11.4 In the ensuing discussion, the Sub-Committee noted the following views:

.1 the proposals in document SDC 9/11 provided a good starting point for the review of the Interim Explanatory Notes;

.2 providing for exemptions in the Interim Explanatory Notes for SOLAS requirements exceeded the scope of the Guidelines;

.3 a holistic approach was needed for the revision of the Interim Explanatory Notes and the proposals in document SDC 9/11 only addressed some of the issues that required updating; and

.4 the revision of the Interim Explanatory Notes should consider the items listed in paragraph 15 of document MSC 102/21/12.

11.5 Subsequently, the Sub-Committee agreed that the review of the Interim Explanatory Notes should be based on document MSC 102/21/12, paragraph 15, taking into account the proposals contained in document SDC 9/11, with the following caveats:

.1 as a clear linkage of the impact of the use of LNG, methanol, hydrogen and other gases or low-flash-point fuels on the implementation of the SRtP regulations could not be clearly established, consideration for inclusion in the Interim Explanatory Notes (MSC.1/Circ.1369) should be a low priority; and

.2 the proposal to include "tanks, voids and auxiliary machinery spaces having little or no fire risk complying with SOLAS regulation II-2/9.2.2.3.2.2(10)" as spaces in which the risk of a fire originating was negligible and thus would not need to be considered as spaces of origin of a fire, was not supported.

11.6 Following the above decisions, the Sub-Committee requested the Working Group on the Revision of the Interim Explanatory Notes for the assessment of passenger ship systems' capabilities after a fire or flooding casualty (MSC.1/Circ.1369) to commence the review of the Interim Explanatory Notes, including identifying further areas for which updated or revised interpretations for the SRtP-requirements in SOLAS were needed.

**Establishment of the Working Group**

11.7 Having considered the above document, the Sub-Committee instructed the Working Group on the Revision of the Interim Explanatory Notes for the assessment of passenger ship systems' capabilities after a fire or flooding casualty (MSC.1/Circ.1369), taking into account the comments made and decisions taken in plenary, to

.1 review the Interim Explanatory Notes based on document MSC 102/21/12, in particular paragraph 15, taking into account document SDC 9/11 and identify further areas for which updated or revised interpretations for the safe return to port requirements in SOLAS were needed, including amendments to related circulars (e.g. MSC.1/Circ.1400, MSC.1/Circ.1437 and MSC.1/Circ.1532); and

.2 consider whether a correspondence group should be established to progress the work and, if so, prepare draft terms of reference for consideration by the Sub-Committee.

**Report of the Working Group**

11.8 Having considered the report of the Working Group (SDC 9/WP.7), the Sub-Committee noted that the Group had agreed that;

.1 the term "remain operational" needed further consideration and should be discussed by the correspondence group;

.2 a definition for "semi-automatic actions" might be needed after the Group had agreed to draft definitions of "manual actions" and "automatic actions";

.3 the term "minimum possible time" in section 4 (Assessment of ship systems' capabilities) should be reviewed;

.4 guidance on support for the crew would be needed, for inclusion in section 6 (Detailed assessment of critical systems);

.5 section 7 (Documentation) should be revised to harmonize documentation requirements, including operational manuals;

.6 the related proposals in document SDC 9/11 should be considered by the correspondence group, apart from the proposal concerning interpretation 8, which had not been supported in plenary;

.7 there was was no need to revise MSC.1/Circ.1400, MSC.1/Circ.1437 or MSC.1/Circ.1532/Rev.1 at the current stage; and

.8 the correspondence group should not embark on a detailed consideration on alternative fuels at this stage; however, this should not preclude discussion on a general level in the correspondence group, if appropriate.

**Re-establishment of the correspondence group**

11.9 In order to progress the work intersessionally, the Sub-Committee agreed to establish the Correspondence Group on the Revision of the Interim Explanatory Notes (MSC.1/Circ.1369) under the coordination of Germany[3] and instructed it to:

.1 continue the review of MSC.1/Circ.1369 (EN) in light of the experience gained since the entry into force of the SOLAS regulations on safe return to port, application of the Explanatory Notes, and the available industry standards (e.g. the Cruise Ship Safety Forum Recommendation 303/20202[4] and the Bahamas Marine Notice MN033);[5]

.2 carefully assess the existing text and interpretations contained in the Explanatory Notes and revise them, as necessary, taking into account documents MSC 102/21/12, SDC 9/11 and SDC 9/WP.7;

.3 develop guidance for new identified areas and new interpretations in the Explanatory Notes, taking into account documents MSC 102/21/12, SDC 9/11 and SDC 9/WP.7;

.4 review the other related circulars (e.g. MSC.1/Circ.1400, MSC.1/Circ.1437 and MSC.1/Circ.1532/Rev.1) based on the review of the Explanatory Notes, if appropriate; and

.5 submit a report to SDC 10.

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4 Cruise Ship Safety Forum Recommendation 303/20202 (weblink).

5 Bahamas Marine Notice MN033 (weblink).

## 12 REVISION OF THE PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON BULK CARRIERS AND SINGLE HOLD CARGO SHIPS OTHER THAN BULK CARRIERS (RESOLUTION MSC.188(79))

### General

12.1 The Sub-Committee recalled that MSC 105 had adopted the *Revised performance standards for water level detectors on ships subject to SOLAS regulations II-1/25, II-1/25-1 and XII/12* (resolution MSC.188(79)/Rev.1) (MSC 105/20, paragraph 15.22).

12.2 The Sub-Committee also recalled that MSC 105 had considered the proposal in document MSC 105/15/1 (Belgium, United States and IACS) for a revised paragraph 2.2.2 of the appendix to the draft revised Performance standards, proposing a change thereto with respect to the measurement of installation height of sensors; however, MSC 105 had not agreed to the proposal and, instead, had decided to request SDC to consider it at its next session (MSC 105/20, paragraph 15.21).

### Proposed amendments to paragraph 2.2.2 of the appendix to the draft revised Performance standards (resolution MSC.188(79)/Rev.1)

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

.1 MSC 105/15/1 (Belgium, United States and IACS), providing clarification on paragraph 2.2.2 of the appendix to the draft revised Performance standards and proposing the way to accurately define the measurement of installation height of sensors between the three SOLAS regulations addressed in the standards; and

.2 SDC 9/12 (Belgium et al.), providing a refined proposal of paragraph 2.2.2 of the appendix to the draft revised Performance standards, based on the comments and input received at MSC 105 on the matter.

12.4 Having decided that a clarification was necessary, the Sub-Committee agreed to the draft amendments to the *Revised performance standards for water level detectors on ships subject to SOLAS regulations II-1/25, II-1/25-1 and XII/12* (resolution MSC.188(79)/Rev.1), as set out in annex 13, for submission to MSC 107 for adoption, for dissemination as resolution MSC.188(79)/Rev.2.

## 13 BIENNIAL STATUS REPORT AND PROVISIONAL AGENDA FOR SDC 10

### General

13.1 The Sub-Committee recalled that the Committee had held two sessions since the Sub-Committee's last meeting (i.e. MSC 105 and MSC 106) and that at both sessions the Committee had approved the Sub-Committee's biennial agenda and the provisional agenda for SDC 9.

13.2 The Sub-Committee also recalled that MSC 106 had agreed to include in the post-biennial agenda of the Committee a new output on "Amendments to the Guidelines for construction, installation, maintenance and inspection/survey of means of embarkation and disembarkation (MSC.1/Circ.1331) concerning the rigging of safety netting on accommodation ladders and gangways", with one session needed to complete the item, assigning the SDC Sub-Committee as the coordinating organ, in association with the SSE Sub-Committee, as and when requested by the SDC Sub-Committee.

13.3 With respect to the above, the Sub-Committee agreed to recommend to the Committee to include the output referred to in paragraph 13.2 in the provisional agenda of SDC 10, and transferred the existing output on "Safety measures for non-SOLAS ships operating in polar waters" to the Committee's post-biennial agenda (see paragraph 3.5).

13.4 Having agreed to the proposal in document SDC 9/15/2 (CESA) (paragraph 15.11) to include the post-biennial output on the revision of the "Guidelines for use of fibre-reinforced plastics (FRP) within ship structures" in the provisional agenda of SDC 10, the Sub-Committee noted that there was no other output on the Committee's post-biennial agenda for which it was solely associated or the coordinating organ.

**Biennial status report and proposed biennial agenda for the 2024-2025 biennium**

13.5 Taking into account the progress made at the session, the Sub-Committee prepared its biennial status report (SDC 9/WP.2, annex 1) and the proposed biennial agenda for the 2024-2025 biennium (SDC 9/WP.2, annex 2), as set out in annexes 14 and 15, respectively, for consideration by MSC 107.

**Proposed provisional agenda for SDC 10**

13.6 Taking into account the progress made at the session, the Sub-Committee prepared the proposed provisional agenda for SDC 10 (SDC 9/WP.2, annex 3), as set out in annex 16, for consideration by MSC 107.

**Correspondence groups established at the session**

13.7 The Sub-Committee established correspondence groups on the following subjects, due to report to SDC 10:

CG 1 – Review of the Guidelines for the Reduction of Underwater Noise (MEPC.1/Circ.833) (see paragraph 5.18);

CG 2 – Safety Objectives and Functional Requirements for SOLAS chapter II-1 (see paragraph 7.12); and

CG 3 – Revision of the Interim explanatory notes for the assessment of passenger ship systems' capabilities after a fire or flooding casualty (see paragraph11.9).

**Arrangements for the next session**

13.8 The Sub-Committee agreed to establish at its next session experts, working and drafting groups on the following subjects (SDC 9/WP.2, annex 4):

.1 safety objectives and functional requirements of the Guidelines on alternative design and arrangements for SOLAS chapter II-1;

.2 revision of the Interim explanatory notes for the assessment of passenger ship systems' capabilities after a fire or flooding casualty (MSC.1/Circ.1369) and related circulars;

.3 development of Guidelines for emergency towing arrangements for ships other than tanker (tbc);

.4 amendments to the Guidelines for construction, installation, maintenance and inspection/survey of means of embarkation and disembarkation (MSC.1/Circ.1331); and

.5 amendments to the 2011 ESP Code / Unified interpretation of provisions of IMO safety, security, environment, facilitation, liability and compensation-related conventions,

whereby the Chair, taking into account the submissions received on the respective subjects, would advise the Sub-Committee before SDC 10 on the final selection of such groups.

**Date of the next session**

13.9 The Sub-Committee noted that the tenth session of the Sub-Committee had been tentatively scheduled to take place from 22 to 26 January 2024.

## 14 ELECTION OF CHAIR AND VICE-CHAIR FOR 2024

14.1 In accordance with the Rules of Procedure of the Maritime Safety Committee, the Sub-Committee unanimously re-elected Mr. Erik Tvedt (Denmark) as Chair and Mr. Jaideep Sirkar (United States) as Vice-Chair, both for 2024.

## 15 ANY OTHER BUSINESS

**Consideration of amendments to SOLAS chapter XII and revision of associated unified interpretations**

15.1 The Sub-Committee recalled that the proposal for a new output to amend SOLAS regulations XII/4, XII/5 and XII/12 contained in document MSC 102/21/9/Rev.1 (Brazil, Marshall Islands and INTERCARGO) had been supported by several delegations at MSC 103, but the Committee had decided to request the Sub-Committee to further consider the proposal and report back to it with a recommendation on the best way forward (MSC 103/21, paragraph 18.23).

15.2 The Sub-Committee also recalled that SDC 8 had considered MSC 102/21/9/Rev.1, together with the comments in document MSC 102/21/21 (IACS), had agreed to defer consideration of the matter, and had invited submissions providing additional information and justification to SDC 9 so as to enable the Sub-Committee to decide on whether or not there was a compelling need for amending SOLAS chapter XII.

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

.1 MSC 102/21/9/Rev.1, containing an output proposal to amend SOLAS chapter XII on additional safety measures for bulk carriers and to revise the *Unified interpretations of SOLAS regulations XII/4.2 and XII/5.2* (MSC/Circ.1178) in order to close gaps in these regulations that were identified during the flag State's marine safety investigation of the loss of the **MV Stellar Daisy**; and

.2 SDC 9/15 (IACS), containing an analysis of the applicable stability requirements contained in SOLAS regulation XII/4 against those offered in document MSC 102/21/9/Rev.1, and recommending that no action was needed due to a lack of technical justification to extend the current damage stability requirements for bulk carriers.

15.4 In the ensuing discussion, the Sub-Committee noted the following views:

.1 the SOLAS bulk carrier definition did not distinguish between converted bulk carriers and purpose-built bulk carriers and the proposed amendments to SOLAS chapter XII would be a positive contribution to safety;

.2 while the conclusions of the casualty investigation were relevant for the particular case of the **MV Stellar Daisy** as an oil tanker converted into an ore carrier of which only one remained in operation, the proposed amendments to apply to all bulk carriers lacked the technical justification;

.3 studies that would show and justify that bulk carriers were generally at risk would constitute such technical justification; and

.4 if the **MV Stellar Daisy** had had water level detectors in the water-ballast tanks, the crew might have noticed the water ingress earlier, leading to a quicker response that would have potentially saved more lives.

15.5 Having noted that there was no broad support for the new output proposal from those that spoke on the matter, in particular highlighting that there was a lack of justification to commence the revision of SOLAS chapter XII, the Sub-Committee agreed to recommend to the Committee that the output proposed in document MSC 102/21/9/Rev.1 not be approved.

**Experience gained with larger FRP structures in ship construction**

15.6 The Sub-Committee recalled that paragraph 4 of the *Interim guidelines for use of fibre-reinforced plastic (FRP) elements within ship structures: Fire safety issues* (MSC.1/Circ.1574) (Interim Guidelines), approved by MSC 98 in 2017, stated that the Interim Guidelines should be reviewed four years after their approval in order to make any necessary amendments based on experience gained.

15.7 The Sub-Committee also recalled that the output "Guidelines for use of fibre-reinforced plastics (FRP) within ship structures" had been placed on the Committee's post-biennial agenda to allow for their review after four years, based on the experience gained with their application.

15.8 In this regard, the Sub-Committee had for its consideration document SDC 9/15/2 (CESA), recounting the experience gained in the application of larger FRP structures during the research project RAMSSES and proposing the review of the Interim Guidelines with a view to the wider application of FRP beyond their current limitation as structures that may be removed without compromising the safety of the ship.

15.9 In addition to the above, the CESA observer stated that the introduction of FRP would reduce structural weight and propulsion powering needs, lower fuel consumption and thus emissions from ships, increase cargo capacity and be a key enabler for emission-reduction technologies, for example by lowering the centre of gravity for ships using wind-assisted propulsion on their superstructure (such as Flettner rotors).

15.10 While supported in general by many delegations, concerns were raised regarding the potential challenges with using FRP, in particular concerning its recycling and its combustibility with respect to fire safety.

15.11 After consideration, the Sub-Committee agreed to invite the Committee to move the output "Guidelines for use of fibre-reinforced plastics (FRP) within ship structures" from its post-biennial agenda to the 2024-2025 biennial agenda, as well as to place it on the provisional agenda of SDC 10 (see also paragraph 13.4).

15.12 Notwithstanding the above, the Sub-Committee also agreed that any work undertaken on the review of the Guidelines would need to take into account and address the issues raised in the Sub-Committee (see paragraph 15.10).

**Holistic approach on the human element**

15.13 The Sub-Committee had for its consideration document SDC 9/15/3 (Secretariat), informing about the request of MSC 105 to all relevant IMO bodies to assess their respective involvement in the human element within their remit and report back to the Committee with a view to devising an outline for a holistic approach in this area, and outlining the current work of the Sub-Committee related to the human element.

15.14 In response to the request, the delegation of the United Kingdom highlighted the need to establish guiding principles to provide a regulatory framework addressing the human element more consistently and which could be applied across the work of this Sub-Committee and others, such as the SSE Sub-Committee. Accordingly, the delegation recommended adopting the principles of human-centred design, an approach to system design and development which placed focus on the end user and which yielded improvements to safety, usability and accessibility through the use of human factors and ergonomics. In this context, it was noted that ISO developed standards 9241-210 (Ergonomics of human-system interactions: Human-centred design for interactive systems) and part 220 (Processes for enabling, executing, and assessing human-centred design within organizations) could supplement this consideration. The delegation therefore proposed that the Sub-Committee note the potential benefit of adopting a human-centred design approach in its future regulatory work, invite concrete proposals to its next session related to the human element, and bring human-centred design to the attention of the Committee.

15.15 Having considered document SDC 9/15/3 and the recommendation by the delegation of the United Kingdom on adopting the principles of human-centred design, the Sub-Committee agreed that there was currently no work undertaken that required action related to the human element for the current matters under its purview.

**Comments on the Explanatory Notes to the Interim guidelines on the second generation intact stability criteria (MSC.1/Circ.1652)**

15.16 In considering matters related to the second generation intact stability criteria, the Sub-Committee noted that the Secretariat had not been able to publish the *Explanatory notes to the Interim guidelines on the second generation intact stability criteria* (MSC.1/Circ.1652) since the various documents comprising the Explanatory Notes produced at SDC 8 required major editorial work from the stability experts and the Secretariat, including translators; however, the Sub-Committee noted that the last set of documents forming the Explanatory Notes had been processed and MSC.1/Circ.1652 would be published by the end of February.

15.17 In this context, the Sub-Committee had for its consideration document SDC 9/15/4 (China), advising that during trial application of the surf-riding/broaching vulnerability criteria in the Explanatory Notes, China had discovered that the coefficients for resistance curve approximation changed and could not be reproduced and that, therefore, the Explanatory Notes required changing.

15.18 In this regard, the delegation of Japan acknowledged the error of the sample data for the application example in the Explanatory Notes, which had occurred when converting the unit from the engineering unit system to the SI unit system, although not relevant for the criteria formulae themselves, and thanked China for precisely pointing it out.

15.19 Having considered a proposal by the delegation of Japan, the Sub-Committee agreed to a correction of the Explanatory Notes (MSC.1/Circ.1652), as set out in annex 17, requested the Secretariat to incorporate the correction in the Notes, and invited the Committee to note this important correction.

**Feedback received on the application of the second generation intact stability criteria**

15.20 Following the decision of SDC 8 to invite interested Member States and international organizations to provide feedback (under this agenda item) to the Organization on the application of the second generation intact stability criteria, based on their use as stipulated in section 1.1.5 (Feedback) in the Interim Guidelines and of part B of the Explanatory Notes thereto, the Sub-Committee noted the following documents:

.1 SDC 9/INF.5 and SDC 9/INF.6 (China), reporting on the sensitivity assessment carried out on the second generation intact stability criteria on six types of real ships, some of which did not satisfy all of the criteria on surf-riding/broaching, dead ship condition, pure loss of stability and parametric rolling; and

.2 SDC 9/INF.7 (China), providing the verification results for the mathematical model for direct stability assessment of pure loss of stability, based on the requirements of the direct stability assessment framework for pure loss of stability in the *Interim guidelines on the second generation intact stability criteria* (MSC.1/Circ.1627).

**Experience gained in using the hybrid system for meetings at IMO**

15.21 The Chair of the Working Group on Safety Objectives and Functional Requirements for SOLAS Chapter II-1, recounting the experience on the use of the hybrid system during the working group meeting, suggested an improvement to the hybrid meeting capability by ensuring that when remote speakers took the floor and wished to comment on the document projected via screenshare, they would be able to see the text when given the floor (currently the ZOOM hybrid meeting showed the remote speaker only, the screenshare document was then not visible).

**Expression of appreciation**

15.22 The Sub-Committee expressed appreciation to the following member of the Secretariat and delegate who had recently retired for their invaluable contribution to its work and wished them a long and happy retirement:

- Mrs. Christine Gregory (IMO) (on retirement)
- Mrs. Anneliese Jost (Germany) (on retirement)

**Expression of condolence**

15.23 The Sub-Committee noted, with great sadness, the recent passing of Edward ("Ted") Nannini, long-time Deputy Permanent Representative of Saint Vincent and the Grenadines, appreciated his contribution to the work of the Organization and expressed its sincere sympathy to his family and colleagues.

## 16 ACTION REQUESTED OF THE COMMITTEES

16.1 The draft report of the session (SDC 9/WP.1/Rev.1) was prepared by the Secretariat for consideration and adoption by the Committee.

16.2 During the meeting held on 27 January 2023, delegations were given the opportunity to provide comments on the draft report (SDC 9/WP.1) and the Secretariat then prepared the revised draft report (SDC 9/WP.1/Rev.1), incorporating the comments made. Member States and international organizations wishing to provide further editorial corrections and improvements, including finalizing individual statements, were given a deadline of 6 February 2023, 23.59 (UTC), to do so by correspondence, in accordance with paragraphs 4.37 and 4.38 of the *Organization and method of work of the Maritime Safety Committee and the Marine Environment Protection Committee and their subsidiary bodies* (MSC-MEPC.1/Circ.5/Rev.4) (see paragraph 1.8).

16.3 The Maritime Safety Committee, at its 107th session, is invited to:

.1 approve the draft MSC resolution on amendments to the International Code on the Enhanced Programme of Inspections during Surveys of Bulk Carriers and Oil Tankers, 2011 (2011 ESP Code), with a view to subsequent adoption (paragraph 6.3 and annex 3);

.2 endorse the recommendation that the functional requirements and expected performances of SOLAS regulations II-1/28, II-1/29 and II-1/30 be considered under the output on "Revision of SOLAS chapters II-1 (part C) and V and related instruments regarding steering and propulsion requirements to address both traditional and non-traditional propulsion and steering system", currently on the post-biennial agenda with the SSE Sub-Committee designated as the coordinating organ (paragraph 7.4.4);

.3 subject to the decision on .2 above, instruct the SSE Sub-Committee to take document SDC 9/7 into account when commencing the work on the above new output (paragraph 7.7);

.4 consider whether the gender-neutral term "continuously attended", instead of the term "manned", be used in the goals for Part E of SOLAS chapter II-1, taking into account that the current regulations in SOLAS chapter II-1 use the term "manned", and take action, as appropriate (paragraphs 7.10 and 7.11);

.5 adopt the draft MSC resolutions on amendments to the 1979, 1989 and 2009 MODU Codes to prohibit materials which contain asbestos (paragraph 8.6 and annexes 4, 5 and 6);

.6 approve the draft MSC circular on unified interpretation on implementation of regulation 2.10.3 of the 2009 MODU Code, regulation 2.8.2 of the 1989 MODU Code and regulation 2.7.2 of the 1979 MODU Code (paragraph 8.8 and annex 7);

.7 approve the draft MSC circular on guidelines for maintenance and monitoring of materials containing asbestos on board MODUs (paragraph 8.9 and annex 8);

.8 approve the draft amendments to SOLAS regulation II-1/3-4 with a view to subsequent adoption, taking into account the associated check/monitoring sheet (paragraph 9.14 and annex 9);

.9 agree to the expansion of the output on "Development of amendments to SOLAS regulation II-1/3-4 to apply requirements for emergency towing equipment for tankers to other types of ship", taking into account the justification prepared by the Sub-Committee (paragraphs 9.15 and 9.16 and annex 15);

.10 note that the III Sub-Committee was invited to consider document SDC 9/10 in connection with its work on the update of the HSSC Survey Guidelines (paragraph 10.5);

.11 approve the draft MSC circular on unified interpretation of SOLAS regulation II-1/1.1.3 (paragraph 10.11 and annex 10);

.12 approve the draft MSC circular on unified interpretations of the 2008 IS Code (MSC.1/Circ.1537/Rev.1), for dissemination as MSC.1/Circ.1537/Rev.2 (paragraph 10.16 and annex 11);

.13 approve the draft MSC circular on unified interpretation of SOLAS chapter II-1 (MSC.1/Circ.1362/Rev.1), for dissemination as MSC.1/Circ.1362/Rev.2 (paragraph 10.23 and annex 12).

.14 approve the draft MSC resolution on revised performance standards for water level detectors on ships subject to SOLAS regulations II-1/25, II-1/25-1 and XII/12, to be disseminated as resolution MSC.188(79)/Rev.2. (paragraph 12.4 and annex 13);

.15 consider the biennial status report of the Sub-Committee for the 2022-2023 biennium and take action, as appropriate (paragraph 13.5 and annex 14);

.16 consider the proposed biennial agenda for the 2024-2025 biennium and take action, as appropriate (paragraphs 3.5, 4.7 13.3, 13.4, 13.5 and 15.11 and annex 15);

.17 consider the proposed provisional agenda for SDC 10 and take action, as appropriate (paragraph 13.6 and annex 16);

.18 note that the Sub-Committee recommended that the proposed output in document MSC 102/21/9/Rev.1 not be approved due to a lack of justification to commence revision of SOLAS chapter XII (paragraph 15.5);

.19 note the important correction to the *Explanatory notes to the Interim guidelines on the second generation intact stability criteria* (MSC.1/Circ.1652) agreed by the Sb-Committee (paragraph 15.19 and annex 17);

.20 note the comments made regarding the use of the hybrid meeting system during the session (paragraph 15.21); and

.21 approve the report in general.

16.4 The Marine Environment Protection Committee, at its eightieth session, is invited to:

.1 note the information on the GEF-UNDP-IMO project called the Global Partnership for Mitigation of Underwater Noise from Shipping (GloNoise Partnership) (paragraph 5.3);

.2 approve the draft MEPC circular on revised guidelines for the reduction of underwater radiated noise from shipping to address impacts on marine life, (paragraph 5.17.1 and annex 1);

.3 endorse the updated work plan for the continued work on underwater radiated noise (paragraph 5.17.2 and annex 2);

.4 consider the draft guidelines for underwater radiated noise reduction in Inuit Nunaat and the Arctic, for utilization in the future by interested parties, with a view to dissemination as a separate circular (paragraph 5.17.2);

.5 approve the convening of an expert workshop on the relationship between energy efficiency and underwater noise, with the participation of relevant experts (paragraph 5.17.3);

.6 encourage interested Member States and international organizations to submit lessons learned/best practices in the implementation of the Revised Guidelines by MEPC 85, including outreach and awareness efforts to support uptake, with a view to identifying necessary revisions to the Revised Guidelines (paragraph 5.17.4); and

.7 note that the Sub-Committee re-established the Correspondence Group on Review of the Guidelines for the Reduction of Underwater Noise (MEPC.1/Circ.833) to continue the remaining work on identifying ways to implement the Revised Guidelines and promote the work of the Organization (paragraph 5.18).

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**ANNEX 1**

**DRAFT MEPC CIRCULAR**

**REVISED GUIDELINES FOR THE REDUCTION OF UNDERWATER RADIATED NOISE FROM SHIPPING TO ADDRESS ADVERSE IMPACTS ON MARINE LIFE**

1 The Marine Environment Protection Committee, at its sixty-sixth session (31 March to 4 April 2014), with a view to providing guidance on the reduction of underwater noise from commercial shipping, and following a recommendation made by the Sub-Committee on Ship Design and Equipment (DE), at its fifty-seventh session, approved the *Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life* (the Guidelines).

2 The Marine Environment Protection Committee, at its [eightieth session (3 to 7 July 2023)], following a comprehensive revision of the Guidelines by the Sub-Committee on Ship Design and Construction (SDC), at its ninth session (23 to 27 January 2023), with a view to increasing awareness, uptake and implementation, approved the annexed *Revised guidelines for the reduction of underwater radiated noise from shipping to address adverse impacts on marine life* (Revised Guidelines).

3 Member States are invited to use the annexed Revised Guidelines with the aim of reducing underwater radiated noise from ships and to bring them to the attention of all parties concerned, in particular ship and equipment designers, shipbuilders and shipowners and operators, classification societies, suppliers, manufacturers and other stakeholders.

4 Member States and international organizations are also invited to submit information, observations, comments and recommendations based on the practical experience gained through the application of these Revised Guidelines to the Marine Environment Protection Committee under the agenda item "Any other business".

5 These Revised Guidelines will take effect on [1 August 2023].

6 This circular revokes MEPC.1/Circ.833.

ANNEX

# REVISED GUIDELINES FOR THE REDUCTION OF UNDERWATER RADIATED NOISE FROM SHIPPING TO ADDRESS ADVERSE IMPACTS ON MARINE LIFE

## 1 PREAMBLE

1.1 Commercial shipping is one of the main contributors to underwater radiated noise (URN), which has adverse effects on critical life functions for a wide range of marine life, including marine mammals, fish and invertebrate species, upon which many coastal Indigenous communities depend for their food, livelihoods and cultures.

1.2 The effective mitigation of URN impact from ships on marine life requires international collaboration and action at various levels, involving multiple stakeholders including, but not limited to, seafarers, designers, shipbuilders, shipowners and ship operators, maritime authorities, suppliers, manufacturers and classification societies. Member States also play an important role in setting expectations for noise reduction targets and establishing mechanisms and programmes through which noise reduction efforts may be realized.

1.3 Sound is the primary sensory mechanism used by aquatic fauna for social interactions, reproduction, navigation, and detection of obstacles, prey, predators and other threats. The most relevant noise sources from ships overlap with hearing ranges and the use of sound by different species. Depending on the species, documented impacts on marine mammals, fish and invertebrates from URN include developmental impairment, poor body condition, increased predation, decreased offspring survival, less feeding, DNA fragmentation, behavioural changes, masking issues and physiological responses. Although impacts of shipping noise have been assessed considering the environment-related characteristics of different regions and the noise sensitivity of different species, based on field observations, laboratory experiments, modelling approaches and Indigenous Knowledge, further data on noise impact on ecological and commercial key species will help inform stakeholders.

1.4 It is important to recognize that for both new and existing ships, the technical feasibility and cost-effectiveness of URN reduction measures, considered either individually or in combination, will be strongly dependent on the design, operational parameters and requirements relevant to a particular ship. A successful strategy to reduce URN should be a process that includes, to the extent possible, the design stage, the baselining of URN measurements (predicted or actual), the development of URN targets, and the implementation, monitoring and assessment of technical and operational measures to achieve those targets. The interactions between the implementation of URN reduction measures and other objectives such as, but not limited to, energy efficiency, biofouling reduction and ship safety, and the resulting contributions should be carefully considered.

## 2 APPLICATION

2.1 These Guidelines may be applied to any ship, taking into account their design and construction, and modifications, as well as their operation.

2.2 These Guidelines do not address the introduction of noise from warships and naval auxiliaries and the deliberate introduction of noise for other purposes such as sonar or seismic activities.

## 3 PURPOSE

3.1. The purpose of these Guidelines is to:

.1 provide an overview of approaches applicable to designers, shipbuilders and ship operators to reduce the URN of any given ship; and

.2 assist relevant stakeholders in establishing mechanisms and programmes through which noise reduction efforts can be realized.

3.2. Given the complexities associated with ship design and construction, and the various approaches for reducing and mitigating URN from ships, these Guidelines focus on identifying primary contributors to URN generated by ships and a general approach that designers, shipbuilders, shipowners and ship operators can undertake. These are associated with propellers, hull form, onboard machinery, wake flow, as well as operational and maintenance aspects.

3.3 These Guidelines describe URN reduction management planning as a tool that may be applied to the operation, design, construction and modification of ships, as far as is reasonable and practical.

3.4 In addition to ship and equipment designers, shipbuilders and shipowners and operators, maritime authorities, classification societies, suppliers, manufacturers and other stakeholders are encouraged to introduce and apply these Guidelines to their specific activities and consider any other technologies and operational measures not included in these Guidelines which may be more appropriate for specific applications and have demonstrated their effectiveness to further reduce URN.

3.5 The development of technological solutions to reduce URN and the scientific knowledge around the impact of URN on marine life will continue to evolve. These Guidelines will be reviewed and updated on a regular basis to ensure that relevant parties have the best available information to inform URN reduction efforts and to take account of linkages with energy efficiency compliance measures. Member States and Observers are encouraged to pass on experience and information received from ship and equipment designers, shipbuilders and operators, scientific organizations, civil society, Indigenous Knowledge holders and others, to assist in improving and updating these Guidelines.

## 4 DEFINITIONS

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

**Baseline URN**: the ship's source level (and associated source depth), for typical operational conditions, that follows from initial predictions and trials or preferably standardized measurements.

**Cavitation:** the reduction of the ambient pressure by a static or dynamic means that can be caused by the propeller or other devices, causing the formation of bubbles in the liquid. The formation refers to both the creation of a new cavity or the expansion of a pre-existing one. When these bubbles are travelling to regions of higher ambient pressure, they collapse generating the major source of noise from powered ships.

**Cavitation inception speed:** the ship speed at which cavitation becomes detectable (either visually or acoustically).

**Existing ship:** a ship which is not a new ship.

**Hearing range:** the range of frequencies the ear or any other sensory organ of an animal can detect.

**Indigenous Knowledge:** a systematic way of thinking applied to phenomena across biological, physical, cultural and spiritual systems. It includes insights based on evidence and acquired through direct and long-term experiences and extensive and multigenerational observation, lessons and skills. It has developed over millennia and is still developing in a living process, including knowledge acquired today and in the future, and it is passed on from generation to generation. Under this definition, Indigenous Knowledge goes beyond observations and ecological knowledge, offering a unique "way of knowing".

**Masking:** where noise interferes with the detection and perception of other sounds important to marine fauna. Masking may, among other effects, cause a reduction or loss of communication range for marine species.

**New ship:** a ship for which the building contract is placed, or 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 the effective date of these Guidelines.

**Propeller noise:** caused by flow phenomena on the propeller as it operates in the wake field of the ship hull. Propeller noise is composed of non-cavitating propeller noise and cavitation noise. Once cavitation occurs, it is typically the most dominant noise source.

**Radiated Noise Level (RNL):** expressed as a sound pressure level in decibels. RNL is a ship source level that assumes the ship can be treated as an acoustic point source. It is computed by taking the product of the distance from a ship reference point, D, and the far-field root-mean-square sound pressure, PRMS(D), at that distance for a specified reference value.

Mathematically,

$$RNL = 20 \cdot log_{10}\left(\frac{P_{RMS}}{P_{REF}}\right) + 20 \cdot log_{10}\left(\frac{D}{D_{REF}}\right) dB$$

The reference value for pressure (PREF) is 1 micro-Pa. The reference value for distance (DREF) is 1 metre. A full technical definition is provided in ISO 17208-1:2016 (Underwater acoustics — Quantities and procedures for description and measurement of underwater sound from ships — Part 1: Requirements for precision measurements in deep water used for comparison purposes.

**Sound Pressure Level:** For underwater noise, 10 times the base-ten logarithm of the square of the ratio of the underwater root-mean-square sound pressure (P) divided by the reference sound pressure of 1 micro-Pascal, $SPL = 10 \cdot \log_{10}(P/P_{REF})^2$ , where PREF = 1 micro-Pascal.

**Structure-borne noise:** Structure-borne noise is vibration in the structure of the ship which will generate noise when a vibrating surface excites the surrounding medium, i.e foundation, pipes, other coupled machines or linked auxiliary equipment. Structure-borne noise is usually measured and quantified using vibration metrics.

**Source Level:** for underwater source levels see ISO 18405:2017 (Underwater acoustics – Terminology). In general, the Source Level is used to quantify how much sound (or vibration) is generated by a device (machinery or other entity, such as a ship) at a reference distance (conventionally at 1 m for underwater acoustics).

**Underwater radiated noise (URN) level:** for the purposes of these Guidelines, refers to noise from any ship. URN level is to be reported in decibels as a sound pressure level.

**Vibration isolation mounts:** vibro-elastic elements (steel springs, rubber or other systems) used to isolate machinery vibration from the ship's structure by reducing the amplitude of vibrational energy. Vibration isolation mounts may also be used to protect the equipment from harmful vibration from outside the ship (e.g. shock inputs during rough weather).

## 5 UNDERWATER RADIATED NOISE (URN) MANAGEMENT PLANNING

5.1 URN Management Planning is a generalized approach applicable to ships in accordance with section 2 that includes possible strategies for URN reduction in design, construction, operation and/or modification.

5.2 Given the complexities associated with ship design and construction and the various approaches to reducing URN, shipowners and designers should undertake URN Management Planning at the earliest design stages. Similarly, URN Management Planning may be carried out for existing ships as far as is reasonable and practicable.

5.3 URN Management Planning is intended to be a flexible tool that allows a customized approach, and may include establishing the baseline (predicted or actual) of a ship's URN, setting URN targets which should be specific and, where possible, quantitative, and evaluating, alone and in combination, various technological, operational and maintenance approaches to reduce URN. Two model templates, with varying levels of detail, are provided in appendix 3 to help guide shipowners/designers in this process.

5.4. Various parties have the following opportunities to support an effective URN Management Planning, including but not limited to:

.1 Shipowners: develop and implement URN Management Plan, include URN requirements in ship design specifications and maintain ships to those specifications.

.2 Designers: design ships as defined by shipowners' operational plan to meet URN requirements.

.3 Shipbuilders: build ship to meet URN specifications.

.4 Ship operators: operate ship to meet URN targets and any additional regional requirements they are operating in.

.5 Maritime authorities: take supportive actions that enable and advance URN Management Planning, for example, supporting deployment of tools to measure ship noise levels, support innovation and adoption of noise reduction technologies, and communicate URN information.

.6 Classification societies: assist shipowners/builders through predictions, trials, relevant URN notations, certification, etc., as reasonable and practicable.

.7 Suppliers and Manufacturers: provide equipment to shipbuilders and shipowners, which will assist the ship to meet URN specifications.

## 6 URN REDUCTION APPROACHES

6.1 The primary sources of URN generated by ships are associated with propellers, hull form, onboard machinery, wake flow as well as operational and maintenance aspects. At typical operating speeds, or near the design ship speed, most URN is caused by propeller cavitation, but onboard machinery and operational aspects are also relevant, especially below cavitation inception speed. Propeller noise itself can be a dominant contributor to overall URN. The optimal URN mitigation strategy for any ship should at least consider all relevant noise sources and mitigation strategies, including any that are not covered in these Guidelines, which may be more appropriate for specific applications.

### Design and technical noise reduction approaches

6.2 The greatest opportunities for reduction of URN will be during the initial design and build stages of the ship. For existing ships, it is unlikely to be practical to match the URN performance achievable by new designs, with the exception of possible modification of propellers in some cases. The following design considerations are therefore primarily intended for consideration for new ships. However, consideration may be given to the modification of existing ships when reasonable and practicable. Table 1 summarizes the design and technical noise reduction approaches that are applicable to new and/or existing ships.

### Hull design and modification

6.3 Flow around the hull may have an influence on URN, since the hull form influences the inflow of water to the propeller. Uneven or non-homogeneous wake fields are known to increase propeller cavitation. Therefore, the ship hull form with its appendages should be designed such that the wake field is as homogeneous as possible to reduce cavitation. Furthermore, the excitation of the ship structure induced by the propeller should not be neglected.

6.4 Consideration should be given to structure-borne noise, to reduce hull URN. Some mitigation measures could be optimization of scantling, application of a decoupling coating, and structural damping.

### Propeller design and modification

6.5 Propellers should be designed and selected to minimize cavitation while considering and optimizing effects on energy efficiency. Cavitation can be the dominant URN source and may increase underwater radiated noise significantly. At typical operating speeds, cavitation can be reduced under normal operating conditions through good design, such as optimizing propeller load, ensuring uniform water flow through propellers (influenced by hull design), and careful selection of the propeller characteristics such as diameter, blade number, blade area, pitch, skew, rake and sections. Analyses and study of hull-propeller interaction can optimize the design of the propeller, hull, rudder and ship performance concurrently.

6.6 Noise-reducing propeller design options are available for many applications and should be considered. However, it is acknowledged that the optimal propeller with regard to URN reduction cannot always be employed due to technical or geometrical constraints (e.g. ice-strengthening of the propeller, mass). It is also acknowledged that some design principles for cavitation reduction can cause decrease of efficiency. Some new state-of-the-art propeller design and concepts have been developed, including high skewed propellers, forward-skew propellers and contra-rotating propellers.

6.7 Some emerging technologies are available to reduce required propulsion power, like wind-assisted-propulsion or hull-lubrication by means of air injection. Those technologies can be considered for possibly reducing the propeller loading and cavitation noise. Consideration should be given to the fact that propulsion load reduction does not have adverse effects on URN, for instance by producing cavitation on the suction side at the same power load level. Air bubble injection into the stern and propeller is also used for reducing URN.

**Wake flow improvement**

6.8 Improving hydrodynamic performance by optimizing hull form design, hull and propeller appendages (e.g. by adoption of a Propulsion Improving Device/Energy Saving Device or an asymmetric stern design) can increase performance and fluid inflow to propeller and reduce URN.

6.9 In order to improve the inflow of a ship propeller, there are many devices that could be used, but these may cause cavitation and as such, should be carefully designed either for new ships or existing ships. Cavitation performance of such devices could be evaluated, and model tested in a cavitation test facility along with the propeller cavitation test, as follows:

.1 Installation of wake conditioning devices and optimization of the rudder design.

.2 Pre-Swirl Stator: some stators before the propeller that can decrease the Blade Passing Frequency of propeller noise and increase the propeller efficiency.

.3 Pre-Shrouded Vanes: Vane and some stators before the propeller that can improve the cavitation performance of the propeller and increase the propeller efficiency.

.4 A hub cap with fins may be useful to improve the wake of a ship propeller. It can recover energy from the propeller wake and increase the propeller efficiency. A hub cap with fins can also help to avoid hub vortex cavitation.

**Machinery design and modification**

6.10 Consideration should be given to the selection of propulsion system and onboard machinery along with appropriate structure-borne sound control measures, proper location of equipment in the hull, and optimization of foundation structures that may contribute to reducing underwater radiated and onboard noise affecting passengers and crew. The ship machinery/equipment line-up should be optimized when or where there is a need to have a reduced noise profile. Reduced URN can be achieved by securing equipment that may not be needed at all times or even during certain parts of a transit. In addition, depending on the ship propulsion plant configuration, further URN reduction can be achieved through selective operation of engines and generator sets. For example, inboard mounted engines may produce lower URN than outboard mounted engines. A "quiet ship profile" can be developed by the measurement of URN of various equipment to understand each unit's contribution to the overall ship noise.

6.11 Airborne sound can excite structure-borne noise that is transmitted into the water. Designers, shipowners and shipbuilders should request that engine/machinery manufacturers supply information on the airborne sound levels and vibration produced by their machinery to allow analysis by methods described in appendix 2 and recommend methods of installation that may help reduce URN.

6.12 Consideration should be given for the appropriate use of vibration isolation mounts, as well as improved dynamic balancing for reciprocating and rotating machinery such as refrigeration plants, air compressors, and pumps. Vibration isolation of other items of equipment such as hydraulics, electrical pumps, piping, large fans, vent and air conditioning ducting may be beneficial for some applications, particularly as a mitigating measure where more direct techniques are not appropriate for the specific application under consideration. Active noise control can also be considered to dampen structure-borne vibration from these sources.

6.13 Vibration isolation mounts can reduce the vibration from machinery to the supporting structure and reduce the structure-borne noise. Because of the propulsion and thrust transfer arrangement, resilient mounts for engines can be mostly considered for four-stroke engines with geared drive, and not the two-stroke engine with direct drive. Two-stroke engines cannot use resilient mounting as the propeller thrust is transferred by the engine directly to the ship structure by the large engine seating area. Flexible coupling between the engine and gearbox can reduce vibration in a geared drive, and further reduce the structure-borne noise. Vibration isolators are more readily used for mounting diesel generators to their foundation for reducing structure-borne noise. In some cases, the adoption of a diesel-electric system should be considered, as it may facilitate effective vibration isolation of the diesel generators, which is not usually possible with large direct drive configurations.

6.14 Alternative power and propulsion systems can help reduce URN. Electric propulsion (e.g. diesel-electric, fuel cell and full electric or battery, podded propulsions or azimuth thrusters) is identified as a promising configuration option for reducing underwater noise. The use of high-quality electric motors and installations will also likely help to reduce vibration being induced into the hull from the electric motor.

**Maintenance and operational approaches**

6.15 Although the main components of URN are generated from the ship design (i.e. hull form, propeller, the interaction of the hull and propeller, and machinery configuration), operational adjustments and maintenance measures should be considered as ways of reducing noise for both new and existing ships. Operational approaches could be particularly important for ships that lack design features or technologies to reduce noise, or for all ships that operate in national and international designated protected areas where additional measures need to be taken to decrease the adverse impacts of shipping noise on marine wildlife. Table 1 summarizes the operational and maintenance approaches that are applicable to new and/or existing ships.

***Maintenance approaches***

6.16 Maintaining the surface quality/finish of propellers, such as when polishing is done properly, removes marine biofouling and vastly reduces surface roughness, helping to reduce propeller cavitation.

6.17 Reducing hull roughness and maintaining a smooth underwater hull surface, by utilizing proper coatings, cleaning, and proactive in-water hull maintenance,[1] may also improve a ship's energy efficiency by reducing the ship's resistance and propeller load. However, it should be noted that ultrasonic anti-fouling systems emit high-frequency sound energy in frequency ranges and at amplitudes that can be harmful to aquatic species. The use of such systems should be avoided where possible in national and international designated protected areas.

[1] Swain, G., Erdogan, C., Foy, L., Gardner, H., Harper, M., Hearin, J., Hunsucker, K.Z., Hunsucker, J.T., Lieberman, K., Nanney, M. and Ralston, E., 2022. *Proactive In-Water Ship Hull Grooming as a Method to Reduce the Environmental Footprint of Ships*. Frontiers in Marine Science, p.2017.

6.18 Machinery vibrations induce structure-borne noise. Proper maintenance of the moving parts and machinery, as well as vibration isolation mounts, helps to keep the vibration and noise low and prevent increasing the noise from operating that machinery.

***Operational approaches***

6.19 Optimizing the ship's trim and draught can reduce the required power and therefore propeller cavitation noise.

6.20 Operators can adjust and optimize ship's routeing, speed and sail time to reduce time at anchor and the URN in port and coastal areas. Voyage planning can facilitate the use of alternate routes to avoid and slowdown, when it can be safely done, in national and international designated protected areas and during critical times of year to decrease impacts of URN on marine life and communities which depend on them. Hydrographic offices and maritime administrations should consider marking and updating national and international designated protected areas in charts to enable the seafarers and harbour users to plan voyages to minimize the impact of their ship's URN on marine life.

6.21 Best practices include reviewing information on national and international designated protected areas to determine whether ships transit through or have operations in such areas. These may include but are not limited to sea-ice covered regions, including Inuit Nunaat, busy ports and shipping lanes overlapping with important or critical habitat for endangered, threatened, or protected species, Important Marine Mammal Areas, Marine Protected Areas as characterized by the Convention on Biological Diversity and other national/regional area-based protection.

6.22 In Inuit Nunaat, a number of characteristics of the region and the activities within them could increase the impacts from URN. This includes potential for icebreaking activities, presence of noise-sensitive species, and potential interference with Indigenous hunting rights. Additional efforts to decrease impacts on marine wildlife are advisable for ships that operate in these areas, including particular attention to reducing the noise impact from icebreaking and implementation of operational approaches and monitoring.

**Ship speed**

6.23 In general, for ships equipped with fixed pitch propellers, reducing ship speed, shaft RPM and/or engine output can be a very effective operational measure for reducing underwater noise, mainly due to reduced cavitation. This is especially the case when speeds are slower than the cavitation inception speed, but even small reductions in power can greatly reduce cavitation. Thus, overridable shaft power limitation or overridable engine power limitation (such as may be adopted to meet the IMO EEXI requirements) would be expected to reduce URN in situations where these limits are below the ship's usual operating power.

6.24 Measure and understand the ship's Cavitation Inception Speed (CIS) and then operate below CIS in national and international designated protected areas when practicable. For ships equipped with controllable pitch propellers, there may be no reduction in noise with reduced speed. Therefore, consideration should be given to optimum combinations of shaft speed and propeller pitch.

6.25 However, there may be other, overriding reasons for a particular speed to be maintained, such as safety, operation and energy efficiency. Consideration should be given in general to any critical speeds of an individual ship with respect to cavitation and resulting increases in URN.

**Table 1 Summary of design, technical, operational and maintenance URN reduction approaches applicable to new and/or existing ships as far as practicable. This list is not exhaustive and should not restrict any other design options that a shipowner may consider as a solution. Please see Ship underwater radiated noise technical report and matrix for further information.**

| URN Reduction Approaches | New ship | Existing ship |
|---|---|---|
| Optimize ship hull form (and appendages) design for hydrodynamic performance and homogeneous wake field to reduce cavitation | X | X |
| Optimizing propeller design to reduce cavitation, optimizing load, ensuring a uniform water flow and hull-propeller interaction and careful selection of the propeller characteristics such as diameter, blade number, blade area, pitch, skew, rake, and sections and innovation material | X | X |
| Emerging technologies like wind-assist technologies to reduce propeller loading and cavitation noise | X | X |
| Air injection to propeller | X | X |
| Wake flow improvement | X | X |
| Careful selection of onboard machinery and installation with appropriate structure-borne noise levels control measures, proper location of equipment in the hull, and optimization of foundation structures | X | |
| Machinery installation and isolation for instance resilient mount and flexible coupling in four-stroke engines with a reduction gear, vibration isolation mounts and improved dynamic balancing for reciprocating machinery | X | X |
| Optimizing the ship's trim to reduce the required power and therefore propeller cavitation noise | X | X |
| Improving voyage planning (e.g. optimum route, coordinated across fleets, national and international designated protected areas/sea-ice covered region, including well-known habitats or migratory pathways) | X | X |
| Reducing speed shaft RPM and/or engine output for ships equipped with fixed pitch propellers[2] | X | X |
| Ships routeing measures[3] to avoid national and international designated protected areas including well-known habitats or migratory pathways | X | X |
| Propeller maintenance (and cleaning/coating) | X | X |
| Hull maintenance (coating and in-water hull maintenance and cleaning, except acoustic anti-fouling systems where possible in national and international designated protected areas) | X | X |

[2] It is vital that sufficient speed and power for safe navigation is maintained. Please refer to MEPC.1/Circ.850/Rev.3 on G*uidelines for determining minimum propulsion power to maintain the manoeuvrability of ships in adverse conditions*.

[3] "Ship routeing measures" refers to the process of moving existing recognized shipping lanes away from national or international protected areas, which may include important marine mammal habitat or migratory pathways. Ship routeing is known as an effective measure to reduce ship noise exposure in the marine environment.

## 7 ENERGY EFFICIENCY AND URN REDUCTION

7.1 Careful consideration should be given to the interrelationships between energy efficiency, GHG and URN reduction while adhering to regulatory obligations and ensuring that the level of URN will meet set targets as established in the URN Management Plan. Many of the energy efficiency improvement options to meet energy efficiency regulations (EEDI, EEXI and CII) may result in an improvement in URN performance and could provide positive synergies with climate policies. Where URN reduction measures are not supportive of energy efficiency, then regulatory obligations pertaining to energy efficiency and emissions must take precedence. URN measures should not come at the expense of IMO requirements on GHG reduction and energy efficiency or other IMO requirements affecting the ship safety as for example manoeuvrability.

7.2 Designers, builders, shipowners and operators should investigate and consider the risk of increasing URN with ship design to achieve lower EEDI, EEXI and/or CII.

7.3 Scrutiny should be given to the co-design of hull and propeller as a unit, such that a uniform wake flow is created to reduce propeller cavitation, as this will also increase energy efficiency, and reduce emissions.

7.4 Reducing propeller cavitation is an effective means of reducing URN. Measures aimed at reducing applied or installed propulsion power and propeller thrust loading, with the appropriate safety caveats,[4] are options to improve energy efficiency, reduce emissions, and typically result in URN reduction, e.g. wind assistance, optimized hull design, and regular maintenance and hull cleaning to avoid fouling and reduce hull resistance are all effective measures for reduced emissions and URN.

7.5 URN computational methods should integrate optimization methods to include the parameters affecting energy efficiency and other emissions at the same time as underwater noise. This will allow optimization with respect to URN, other emissions and efficiency/performance.

## 8 EVALUATION AND MONITORING

8.1 Evaluation and ongoing monitoring of URN is an essential step towards assessing the effectiveness of efforts to reduce noise in the oceans. This may be done through actual measurement of ship URN, or through the modelling of ship URN based on its characteristics and design parameters, as well as environmental conditions.

8.2 Modelling of URN needs to take into account sound propagation loss as this is influenced by several environmental parameters (e.g. sea state, sea ice, sound speed profile, seawater temperature, sound absorption, currents, bathymetry, the properties of the sea bottom). There exist a variety of underwater sound propagation models to address the objectives of the specific application.

8.3 Efforts should be made to better understand status and changes in URN. Monitoring capacity developed in partnership with interested ports should be encouraged along shipping lanes and used in incentive programmes to complement other URN monitoring programmes, where possible.

8.4 Efforts should be made to support community-led efforts to understand underwater noise from shipping and its impacts on marine species and coastal communities.

[4] See MEPC.1/Circ.850/Rev.3.

8.5 Member States and other stakeholders, including classification societies, designers, shipbuilders, shipowners and ship operators, suppliers and manufacturers may contribute data, where possible, to the global understanding of ship noise emissions, including through established monitoring programmes of ship source levels and/or ambient noise.

8.6 URN data gathered, and results of applied measures may be shared by submitting information, observations, suggestions, comments and recommendations based on the practical experience gained through the application of these Guidelines to the Marine Environment Committee under "Any other business". Data can be shared anonymously for the purpose of supporting planning and development by the Member States, and other stakeholders.

## 9 INCENTIVIZATION

9.1 Maritime authorities, financial and insurance institutions and others are encouraged to promote establishing incentive schemes to support the implementation of URN monitoring programmes and noise reduction efforts by suppliers, designers, shipbuilders, shipowners and operators, where considered appropriate. Incentives can also support the collection and sharing of data about ship URN generally.

9.2 Incentivization could be, for instance, based on relevant URN ship class notations, recognition of a URN Management Plan, URN reduction targets, ship and engine technologies and maintenance, ship speed reduction programmes, Onshore Power Supply in-port or other voluntary sustainability certifications which include evidence of URN reduction or complementary benefits on efficiency and maintenance (e.g. preventing biofouling by in-water cleaning of ship hull and propeller could increase efficiency and minimize the transfer of invasive species).

9.3 Examples of incentives are discount on the port dues, fairway fees, discount or extra services or products, promotion, among others.

9.4 Suppliers, designers, builders, shipowners and operators should make themselves aware of and strive to achieve incentives related to URN reduction.

## APPENDIX 1

## INTERNATIONAL URN MEASUREMENT STANDARDS, RECOMMENDATIONS AND CLASSIFICATION SOCIETY RULES

1 Shipowners, designers and operators and other stakeholders may use the most appropriate and updated noise measurement standard listed below for their context.

2 ANSI S12.64 and ISO-17208-1[5] are two versions of the same standard. It included three grades: survey, engineering and precision, with the latter being the most accurate methodology. ISO-17208-1 was taken from S12.64 and adopted for international use, with the primary difference being the removal of the three grades. Both standards are for the measurement of the Radiated Noise Level (RNL) of a ship in deep water. ISO-17208-2[6] provides a methodology to take data measured using ISO-17208-1 and convert the measured RNL to Monopole Source Level (MSL). These two standards would be most relevant to the measurement of ship noise. Both standards would be necessary, when using MSL metrics.

**Non-exhaustive List of URN Measurement Standards**

| Standard or Organization | Date issued | Scope | Methodology | Minimum water depth |
|---|---|---|---|---|
| ICES-CRR-209[7] | May 1995 | Applies only to fishery research vessels (R/V). This document provides guidance on ambient noise, fish hearing, ship noise, fish reaction to ship noise, URN instrumentation, noise mitigation for R/Vs. | The intended methodology for results in sound pressure level at 1 metre in 1 Hertz (narrowband) spectrum. No distance correction process is given. | Not specified |

5 **ISO 17208-1** Underwater acoustics — Quantities and procedures for description and measurement of underwater sound from ships — Part 1: Requirements for precision measurements in deep water used for comparison purposes.

6 **ISO 17208-2** Underwater acoustics — Quantities and procedures for description and measurement of underwater sound from ships — Part 2: Determination of source levels from deep-water measurements.

7 International Council for the Exploration of the Seas (ICES), Cooperative Research Report 209, *Underwater Noise of Research Vessels, Review and Recommendations*, dated May 1995.

| Standard or Organization | Date issued | Scope | Methodology | Minimum water depth |
|---|---|---|---|---|
| ANSI/ASA S12.64[8] | Sep 2009 | Applies to any ship of any size with speed less than 50 knots. (This is the first standard for URN measurement of commercial ships.) | Results are in sound pressure level at 1 m assuming the ship is modelled as a point source using spherical spreading. There are three grades of measurement: Precision, Engineering, and Survey. Uses three hydrophones located in the water column with a beam aspect. | *Prec*.: 300 m or 3x L *Eng*: 150 m or 1.5x L *Survey*: 75 m of 1x L where L is overall ship length. |
| Bureau Veritas, DNV[9] | Nov 2015 | Applies to commercial ships, which includes any ship engaged in commercial trade or carrying passengers for hire. | Results are in sound pressure level at 1 m using calculated propagation loss with the ship modelled at a monopole sound source. | Not specified |
| ISO-17208-1[10] | March 2016 | Same as S12.64 (above) | Methodology and results are mostly the same as S12.64 but with a single grade between the precision and engineering grades of S12.64. Uses three hydrophones located in the water column with a beam aspect. | Greater of 150 m or as given in Note (1) |

8 American National Standards Institute (ANSI)/Acoustical Society of America (ASA) S12.64-2009; *Quantities and Procedures for Description and Measurement of Underwater Sound from Ships – Part 1: General Requirements*, dated September 2009.

9 Achieve Quieter Oceans by Shipping Noise Footprint Reduction (AQUO) and Suppression of UW Noise Induced by Cavitation (SONIC), *Guidelines for Regulation on UW Noise from Commercial Shipping*.

10 International Standards Organization (ISO), ISO-17208-1-2016; *Underwater acoustics — Quantities and procedures for description and measurement of underwater sound from ships — Part 1: Requirements for precision measurements in deep water used for comparison purposes*, dated March 2016.

| Standard or Organization | Date issued | Scope | Methodology | Minimum water depth |
|---|---|---|---|---|
| ITTC Guidelines 7.5-04[11] | Sep 2017 | Applies to measuring underwater radiated noise from surface ships. | Results are in sound pressure level at 1 m assuming spherical spreading and adjusted by a distance normalization. | 300 m or three times ship length for highest grade; 150 m or 1.5 times ship length for middle grade; 75 m or 1 times ship length for lowest grade. |
| Lloyds Register[12] | Feb 2018 | Applies to any ship which had URN measured and certified in accordance with LR's *SHIPRIGHT* notation. | Deep-water correction provided assuming measurements in accordance with ISO-17208-1. Shallow water shall be performed as given in ISO-17208-1. Uses three hydrophones located in the water column with a beam aspect. | Greater of 60 m or as given in Note (2) |
| Bureau Veritas[13] | July 2018 | Applies to any self-propelled ship. | Results are in sound pressure level at 1 m using calculated transmission loss with the ship modelled at a monopole sound source. Uses three hydrophones located in the water column with a beam aspect. | Greater of 60 m or as given in Note (3) |
| China Classification Society[14] | Oct 2018 | Applies to ships applying for CCS class notation. | Results are in sound pressure level at 1 m assuming spherical spreading and using calculated transmission loss. | When the single-hydrophone method is used, the keel clearance is in general not to be less than 40 m and not less than 60 m |

11 International Towing Tank Conference (ITTC), Recommended Procedures and guidelines - Underwater Noise from Ships - Full scale measurements.

12 Lloyd's Register (LR), *Additional Design Procedures, Additional Design & Construction Procedure for the Determination of a Vessels Underwater Radiated Noise*, February 2018.

13 Bureau Veritas, *Underwater Radiated Noise*, Rule Note NR 614 DT R02 E, dated July 2018.

14 China Classification Society, *Guidelines for underwater radiated noise of ships*, October 2018.

| Standard or Organization | Date issued | Scope | Methodology | Minimum water depth |
|---|---|---|---|---|
| | | | | for a multiple-hydrophone method. |
| ISO-17208-2[15] | July 2019 | This document specifies methods for calculating an equivalent monopole source level by converting radiated noise level values obtained in deep water according to ISO 17208-1. | This is not a ship measurement standard, must use ISO-17208-1 for field measurements. | N/A |
| DNV[16] | July 2019 | Applies to all ships looking to achieve the DNV-GL *SILENT* notation. | Deep-water methodology to follow ISO-17208-1 (given above).<br>Shallow water uses unique method with a single bottom mounted hydrophone and distance correction performed using actual site measured transmission loss or the relationship 18xLog(r) where r is the distance between the ship and hydrophone. | 150 m (for deep-water testing regardless of ship length)<br>30 m (for shallow water testing) |
| DNV[17] | July 2020 | Applies to all ships looking to achieve the DNV-GL *SILENT* notation. | Results are in sound pressure level at 1 m assuming the ship is modelled as a point or line source as determined during the evaluation.<br>This document only provides the limits and need to conduct measurement according to DNVGL-CG-0313 (above). | N/A |

15 International Standards Organization (ISO), ISO-17208-2-2019; *Underwater acoustics — Quantities and procedures for description and measurement of underwater sound from ships — Part 2: Determination of source levels from deep water measurements* dated July 2019.

16 Det Norske Veritas/Germanischer Lloyd (DNV/GL), Class Guideline DNVGL-CG-0313, *Measurement procedures for noise emission*, dated July 2019.

17 Det Norske Veritas/Germanischer Lloyd (DNV/GL), Rules for Classification, Ships, Part 6, *Additional class notations, Chapter 7 Environmental Protection and Pollution Control*, dated July 2020.

| Standard or Organization | Date issued | Scope | Methodology | Minimum water depth |
|---|---|---|---|---|
| ABS[18] | May 2021 | Applies to self-propelled commercial and research ships | Results are in sound pressure level at 1 m using spherical spreading for deep water and calculated transmission loss (by provided equation) for shallow water. Uses three hydrophones located in the water column with a beam aspect. | Greater of 60 m or as given in Note (4) |
| RINA[19] | 2021 | Applies to all ships looking to achieve the RINA *DOLPHIN QUIET* or *TRANSIT* notations. | Results are in sound pressure level at 1 m assuming the ship is modelled as a point source using spherical spreading. Uses three hydrophones located in the water column with a beam aspect. | 150 m or as given in Note (5) |
| Korean Register[20] | July 2021 | Applies to new and existing ships that have applied for the optional notation URN (Underwater Radiated Noise) for the ship's underwater radiated noise | Results are in sound pressure level at 1 m | At least 60 m |

**MINIMUM WATER DEPTH NOTES:**

1. ISO-17208-1: 1.5 x overall ship length which is the longitudinal distance between the forward-most and aft-most part of a ship.
2. Lloyds Register: 0.3 x $v^2$ where v is ship speed in m/s or 3 x $(B \times Dt)^{1/2}$ where B is ship width and Dt is ship draft both in metres.
3. Bureau Veritas: 0.3 x $v^2$ where v is ship speed in m/s. Deep water is 200 m or 2x the ship length unless the ship is greater than 200 m then 1.5 times the ship length.
4. ABS: 0.3 x $v^2$ where v is ship speed in m/s. Deep water is the greater of 150 m or 1.5x the ship length.
5. RINA: Measurements can be performed in shallow water as long as adequate procedure for actual transmission loss has been agreed with RINA.

18 American Bureau of Shipping (ABS), *Underwater Noise and External Airborne Noise*, dated May 2021.

19 Registro Italiano Navale (RINA), Dolphin Quiet Ship and Dolphin Transit Ship, dated 2021.

20 Korean Register: Guidance for Underwater Radiated Noise (July 2021).

## APPENDIX 2

## TYPES OF COMPUTATIONAL MODELS FOR OPTIMIZING SHIP DESIGN AND TECHNICAL UNDERWATER RADIATED NOISE REDUCTION APPROACHES

Types of computational models for optimizing ship design and technical URN reduction approaches are:

.1 **Flow characteristics:** Computational Fluid Dynamics (CFD) can be used to predict and visualize flow characteristics, cavitation and hydroacoustic sources around the hull and appendages, and the wake field in which the propeller operates. Also, propeller analysis methods such as lifting surface methods or CFD can be used for predicting and trialling the effect of cavitation on the propeller performance.

.2 **Noise radiation**: Finite Element Analysis, Boundary Element Method and Statistical Energy Analysis can be used to estimate radiated noise due to flow field, cavitation, and machinery excitations. Bathymetry, sea bottom, sea surface and the elastic ship structures can be accounted for. Other methods to predict radiation include hybrid methods, wave-based methods, and Energy Flow Method. Most methods can be used both for structures and fluids.

.3 **Noise propagation**: the noise path from source to receptor, depends on the environment and some sound characteristics. Methods such as ray theory, normal modes, wavenumber integration or parabolic equations can be used for modelling long-range propagation of sound.

Standardized model tests of propeller URN in combination with cavitation tests provide the possibility for manufacturers, suppliers, shipowners and shipbuilders to agree whether contractual specifications regarding the propeller contribution to URN are fulfilled before the ship is built.

.1 Model-scale cavitation tests[21] have a possibility to offer at present the most accurate prediction and trial of URN source levels of cavitating propellers showing good to acceptable agreement with sea trials on URN source levels. However, scale effects and the effect of facility dependent background and reverberation noises should be considered carefully, and further improvements on these topics are expected from ongoing studies. Furthermore, as these model tests focus on cavitation noise only, the impact of a cavitation noise mitigation measure can be well evaluated. The impact of this mitigation measure on the total ship noise requires knowledge of the other noise sources such as machinery and structure-borne noise.

.2 The ship, its propeller, and special appendages (such as shaft bracket and Fin Stabilizer) could be model tested in a cavitation test facility such as a cavitation tunnel for measuring the design aspects with respect to cavitation induced pressure pulses, cavitation inception speed and radiated noise.

URN model predictions and trials should be assessed, when possible, with scaled or full-size model validation tests preferably in controlled environments.

[21] ITTC – Recommended Procedures and Guidelines, Model-Scale Propeller Cavitation Noise Measurements, 7.5–02–03–03.9.

## APPENDIX 3

## SAMPLE TEMPLATES FOR URN MANAGEMENT PLANNING

To assist shipowners with the development of a URN management plan that can be customized to meet their needs, two templates are provided as samples of what a URN management plan may contain. These are provided solely for guidance and can be further modified to address specific contexts of individual shipowners.

**Sample Template #1: Aspirational plan with initial steps:**

**Underwater Radiated Noise Management Plan**

### 1. Objective

This section should include an overview of the high-level objective regarding URN reduction of ships. For example, this may be framed as "Over the next five years, we intend to achieve the following objectives [….], and identify further opportunities to reduce the noise from our ships".

### 2. Approach

This section should describe the various efforts that will be taken to achieve the overall objective. This may include investments in research, efforts to measure the noise signature of ships, identification/implementation of operational or technical solutions relevant to the ship.

### 3. Monitoring/Evaluation Methods

This section should include a brief outline of how the shipowner/ship operator intends to monitor, assess and evaluate the progress of their plan over time.

**Sample Template #2: Detailed plan that more explicitly follows the Plan-Implement-Monitor-Evaluate cycle**

**Underwater Radiated Noise Management Plan**

### 1. Overview

This section should include an overview of the high-level objective regarding the URN reduction of ships and the intention of the plan. For example, this may be framed as "Over the next five years, we intend to achieve the following objectives [….], implement the following steps […] identify further opportunities to reduce the noise from our ships".

### 2. Baseline URN

This section should provide an overview of how a baseline URN could be determined.

As far as practicable, efforts should be made to determine a ship's baseline. Ship baseline URN condition may be predicted (computational/empirical/model tests) or preferably measured. Baselining the predicted and/or measured URN ship condition should be conducted under the ship's normal operating conditions, including typical operational speed and draught, with use of standard operating equipment/machinery.

URN should be measured to an objective standard. Appendix 1 summarizes the availability of recognized measurement standards that have been used in research and to support port programmes. Appendix 2 provides examples of computational models for optimizing ship design and technical noise reduction approaches.

## 3. URN targets

This section should outline the overall target source-noise reductions that the plan is aiming to achieve. The information below provides some possible guidance on how said targets could be established.

Research has documented significant variability among regions in underwater sound propagation conditions, contributions to URN levels and hearing sensitivity and adverse physiological or behavioural responses to ship noise among marine species. Biologically based noise limits are thus likely to reflect this variability, with any universal limit serving as a summary of impact reduction interests across diverse environments. However, individual ship-based noise targets established by ship class, tonnage or another characteristic can be established based on baseline measurements, actual or predicted. These URN reduction targets can be gradually strengthened over a specified period, to be established by the shipowner.

URN targets for a given ship should consider the ship's purpose, type, URN prediction and baseline measurement, as well as operational considerations. URN reduction targets can also be established by adoption of one of the classification societies' sets of URN-related rules. Alternatively, shipowners can establish URN reduction targets, inter alia, reducing noise levels by a certain percentage.

## 4. URN Reduction Approaches and related actions

This section provides the opportunity to clearly articulate the approaches to be taken to reduce underwater noise. This could include a combination of both technical and operational approaches, that may be adapted over time. It may also include the identification of research initiatives or other collaborative projects to advance knowledge and awareness of URN reduction efforts. See section 6 of the guidelines for guidance on the types of approaches that could be utilized.

## 5. Monitoring and Evaluation

This section should show how ship noise reduction efforts could be monitored and evaluated.

As part of URN Management Planning, shipowners and operators should develop a monitoring approach to evaluate periodically the effectiveness of ship noise reduction efforts in comparison with baseline measurements and URN targets and to guide and enhance activities aimed at noise reduction (section 8). Such evaluation may include forms of URN measurements, simulations, modelling or other scientific methods of data gathering and evaluation.

Consideration should be given to measuring the ship's URN from the identified noise sources at expected range of typical operating conditions to determine if the URN targets of the ship are being met. These enable ship operators to optimize ship operation and adjust URN levels appropriately along a route (e.g. by optimization of the ship's trim, thereby reducing the required power, or by reducing speed, when safe to do so, both possibly resulting in reduced propeller cavitation noise). Verification of maintenance of previously acceptable noise levels

may also be demonstrated by records of adequate maintenance of machinery hull and propeller condition.

Between measurement activities, URN can be monitored in situ. Development of real-time dynamic voyage optimization tools which provide personalized analytical information to increase efficiency, save on fuel and costs, and reduce emissions show promise for adaptive management. Noise reduction should be added as a further optimization option.

***

# ANNEX 2

## UPDATED WORK PLAN FOR THE CONTINUED WORK ON UNDERWATER RADIATED NOISE

| | OUTCOME | MEASURES/ACTIONS | LEAD (SDC WG, CG, SDC, MEPC, ETC.) | TIMELINE |
|---|---|---|---|---|
| 1. | Finalize the revised Guidelines | Amend and finalize the revision of the 2014 Guidelines, taking into account documents SDC 9/5, SDC 9/INF.2 and any other documents submitted for this agenda item | SDC 9 | January 2023 |
| | | Recommend to MEPC to approve the revised Guidelines | SDC 9<br>MEPC 80 | July 2023 |
| 2. | Identify ways to implement the revised Guidelines and promote the work of the Organization to increase the awareness, the uptake and implementation of the revised Guidelines and identify most appropriate tools | Recommend to MEPC 80 to encourage Member States and observers to submit lessons learned/best practices in the implementation of the revised Guidelines by MEPC 85, including outreach and awareness efforts to support uptake with a view to identify necessary adjustments/ modifications to the Guidelines | SDC 9<br>MEPC 80<br>MEPC 81<br>MEPC 82<br>MEPC 83<br>MEPC 84<br>MEPC 85 | July 2026 |
| | | Revise the flow chart on the URN Noise Management Planning process in the annex to document SDC 9/INF.2 to reflect the Revised Guidelines and appendix 3, to be used as a tool for raising awareness of the Revised Guidelines | SDC 9 CG<br>SDC 10<br>MEPC 81 | Spring 2024 |
| 3. | Organize an expert workshop on potential co-benefits and trade-offs that may exist between the reduction of underwater radiated noise from ships and energy efficiency, and produce a paper to be submitted to the relevant body | Recommend to MEPC to approve the convening of an expert workshop on the relationship between energy efficiency and underwater noise, inviting relevant experts from other relevant IMO bodies | SDC 9<br>MEPC 80<br>Relevant body | Workshop conducted in 2023; Completion by spring 2024 |
| 4. | Develop a proposal for a programme of action to be presented at SDC 10 which could be reviewed/finalized at MEPC 81 | Establish a correspondence group to finalize and prioritize the provisional list of suggested next steps to further prevent and reduce underwater radiated noise from ships, as set out in annexes 4 to 7 of SDC 9/5 | SDC 9<br>SDC 9 CG<br>SDC 10<br>MEPC 81 | Spring 2024 |

***

**ANNEX 3**

**DRAFT MSC RESOLUTION**

**AMENDMENTS TO THE INTERNATIONAL CODE ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF BULK CARRIERS AND OIL TANKERS, 2011 (2011 ESP CODE)**

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

NOTING resolution A.1049(27), by which the Assembly adopted the International Code on the Enhanced Programme of Inspections during Surveys of Bulk Carriers and Oil Tankers, 2011 ("the 2011 ESP Code"), which has become mandatory under chapter XI-1 of the International Convention for the Safety of Life at Sea, 1974 ("the Convention"),

NOTING ALSO article VIII(b) and regulation XI-1/2 of the Convention concerning the procedure for amending the 2011 ESP Code,

HAVING CONSIDERED, at its 107th session, amendments to the 2011 ESP Code, proposed and circulated in accordance with article VIII(b)(i) of the Convention,

1 ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the 2011 ESP Code the text of which is set out in the annex to the present resolution;

2 DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the said amendments shall be deemed to have been accepted on [1 July 2025], unless, prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet have notified their objections to the amendments;

3 INVITES Contracting Governments to the Convention to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on [1 January 2026] upon their acceptance in accordance with paragraph 2 above;

4 REQUESTS the Secretary-General, for the purposes of article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Contracting Governments to the Convention;

5 ALSO REQUESTS the Secretary-General to transmit copies of this resolution and its annex to Members of the Organization which are not Contracting Governments to the Convention.

ANNEX

**AMENDMENTS TO THE INTERNATIONAL CODE ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF BULK CARRIERS AND OIL TANKERS, 2011 (2011 ESP CODE)**

In Annex A, part A (annex 5), in Annex A, part B (annex 5), in Annex B, part A (annex 8) and in Annex B, part B (annex 7) on *Procedures for approval and certification of a firm engaged in thickness measurement of hull structures*, amend as follows:

"**2 Procedures for approval and certification**

***Submission of documents***

2.1 The following documents shall be submitted to ~~an organization recognized by~~ the Administration for approval: […]

***Auditing of the firm***

2.2 Upon reviewing of the documents submitted with satisfactory results, the firm shall be audited by the Administration in order to ascertain that the firm is duly organized and managed in accordance with the documents submitted and is capable of conducting thickness measurement of the hull structure of ships."

***

**ANNEX 4**

**DRAFT MSC RESOLUTION**

**AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF MOBILE OFFSHORE DRILLING UNITS, 2009**

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

NOTING that mobile offshore drilling units continue to be moved and operated internationally,

RECALLING that the Assembly, when adopting the Code for the Construction and Equipment of Mobile Offshore Drilling Units in 2009 by resolution A.1023(26), authorized the Committee to amend the Code as appropriate, taking into consideration developments in design and technology, in consultation with appropriate organizations,

RECALLING ALSO that, in accordance with regulation II-1/3-5 of the International Convention for the Safety of Life at Sea (SOLAS), 1974, new installation of materials which contain asbestos is prohibited on all ships, which do not include MODUs,

RECOGNIZING that regulation 2.10.3 of the 2009 MODU Code covers the prohibition of materials containing asbestos that is applicable to new units at the time of construction, but does not cover new installation of materials on existing MODUs,

HAVING CONSIDERED, at its [107th] session, recommendations made by the Sub-Committee on Ship Design and Construction, at its ninth session (23 to 27 January 2022),

1 ADOPTS amendments to the 2009 MODU Code the text of which is set out in the annex to the present resolution;

2 INVITES all Governments concerned to take appropriate steps to give effect to the annexed amendments to the 2009 MODU Code by [1 January 2024].

ANNEX

**AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF MOBILE OFFSHORE DRILLING UNITS, 2009 (2009 MODU CODE) (Resolution A.1023(26))**

Note: Proposed amendments are shown in additions/~~deletions~~.

## CHAPTER 2

## CONSTRUCTION, STRENGTH AND MATERIALS

…

### 2.10 Materials

2.10.1 Units should be constructed from steel or other suitable material having properties acceptable to the Administration taking into consideration the temperature extremes in the areas in which the unit is intended to operate.

2.10.2 Consideration should be given to the minimization of hazardous substances used in the design and construction of the unit and should facilitate recycling and removal of hazardous materials.[1]

2.10.3 For all MODUs, new installation of materials which contain asbestos should be prohibited.[2]

***

[1] Refer to the *Guidelines on ship recycling*, adopted by the Organization by resolution A.962(23), as amended (refer to A.980(24)).

[2] Refer to the *Unified interpretation on implementation of regulation 2.10.3 of the 2009 MODU Code, regulation 2.8.2 of the 1989 MODU Code and regulation 2.7.2 of the 1979 MODU Code* (MSC.1/Circ.[…]).

**ANNEX 5**

**DRAFT MSC RESOLUTION**

**AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF MOBILE OFFSHORE DRILLING UNITS, 1989**

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

NOTING that mobile offshore drilling units continue to be moved and operated internationally,

RECALLING that the Assembly, when adopting the Code for the Construction and Equipment of Mobile Offshore Drilling Units in 1989 by resolution A.649(16), authorized the Committee to amend the Code when appropriate, taking into consideration the developing design and safety features after due consultation with appropriate organizations,

RECALLING ALSO that, in accordance with regulation II-1/3-5 of the International Convention for the Safety of Life at Sea (SOLAS), 1974, new installation of materials which contain asbestos is prohibited on all ships, which do not include MODUs,

RECOGNIZING that the 1989 MODU Code does not contain any requirements for materials containing asbestos,

HAVING CONSIDERED, at its [107th] session, recommendations made by the Sub-Committee on Ship Design and Construction, at its ninth session (23 to 27 January 2022),

1 ADOPTS amendments to the 1989 Code the text of which is set out in the annex to the present resolution;

2 INVITES all Governments concerned to take appropriate steps to give effect to the annexed amendments to the 1989 MODU Code by [1 January 2024].

ANNEX

**AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF MOBILE OFFSHORE DRILLING UNITS, 1989 (1989 MODU CODE) (Resolution A.649(16))**

Note: Proposed amendments are shown in additions/~~deletions~~.

## CHAPTER 2 – CONSTRUCTION, STRENGTH AND MATERIALS

…

### 2.8 Materials

2.8.1 Units should be constructed from steel or other suitable material having properties acceptable to the Administration.

2.8.2 For all MODUs, new installation of materials which contain asbestos should be prohibited.*

***

* Refer to the *Unified interpretation on implementation of regulation 2.10.3 of the 2009 MODU Code, regulation 2.8.2 of the 1989 MODU Code and regulation 2.7.2 of the 1979 MODU Code* (MSC.1/Circ.[…]).

**ANNEX 6**

**DRAFT MSC RESOLUTION**

**AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF MOBILE OFFSHORE DRILLING UNITS, 1979**

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

NOTING that mobile offshore drilling units continue to be moved and operated internationally,

RECALLING that the Assembly, when adopting the Code for the Construction and Equipment of Mobile Offshore Drilling Units in 1979 by resolution A.414(XI), authorized the Committee to amend the Code as necessary after due consultations with appropriate organizations,

RECALLING ALSO that, in accordance with regulation II-1/3-5 of the International Convention for the Safety of Life at Sea (SOLAS), 1974, new installation of materials which contain asbestos is prohibited on all ships, which do not include MODUs,

RECOGNIZING that the 1979 MODU Code does not contain any requirements for materials containing asbestos,

HAVING CONSIDERED, at its [107th] session, recommendations made by the Sub-Committee on Ship Design and Construction, at its ninth session (23 to 27 January 2022),

1 ADOPTS amendments to the 1979 Code the text of which is set out in the annex to the present resolution;

2 INVITES all Governments concerned to take appropriate steps to give effect to the annexed amendments to the 1979 MODU Code by [1 January 2024].

ANNEX

**AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF MOBILE OFFSHORE DRILLING UNITS (1979 MODU CODE)**
**(Resolution A.414(XI))**

Note: Proposed amendments are shown in additions/~~deletions~~.

## CHAPTER 2 – CONSTRUCTION, STRENGTH AND MATERIALS

…

### 2.7 Materials

2.7.1 Units should be constructed from steel or other suitable material having properties acceptable to the Administration.

2.7.2 For all MODUs, new installation of materials which contain asbestos should be prohibited.*

***

* Refer to the *Unified interpretation on implementation of regulation 2.10.3 of the 2009 MODU Code, regulation 2.8.2 of the 1989 MODU Code and regulation 2.7.2 of the 1979 MODU Code* (MSC.1/ Circ.[…]).

**ANNEX 7**

**DRAFT MSC CIRCULAR**

**UNIFIED INTERPRETATION ON IMPLEMENTATION OF REGULATION 2.10.3 OF THE 2009 MODU CODE, REGULATION 2.8.2 OF THE 1989 MODU CODE AND REGULATION 2.7.2 OF THE 1979 MODU CODE**

1 The Maritime Safety Committee, at its [107th session (31 May to 9 June 2023)], approved *Unified interpretation on implementation of regulation 2.10.3 of the 2009 MODU Code, regulation 2.8.2 of the 1989 MODU Code and regulation 2.7.2 of the 1979 MODU Code*, prepared by the Sub-Committee on Ship Design and Construction, at its ninth session, as set out in the annex.

2 Member States are invited to apply the annexed unified interpretations and to bring them to the attention of all parties concerned.

ANNEX

**UNIFIED INTERPRETATION ON IMPLEMENTATION OF REGULATION 2.10.3 OF THE 2009 MODU CODE, REGULATION 2.8.2 OF THE 1989 MODU CODE and REGULATION 2.7.2 OF THE 1979 MODU CODE**

1 In the context of regulation 2.10.3 of the 2009 MODU Code, regulation 2.8.2 of the 1989 MODU Code and regulation 2.7.2 of the 1979 MODU Code, the use of the phrase "new installation of materials which contain asbestos should be prohibited"[1] means that:

On or after 1 January 2024:

.1 materials containing asbestos should be prohibited from being installed on board; and

.2 any repairs, replacements, maintenance or additions to working parts[2] of a MODU should be documented with an asbestos-free declaration for the materials used (see appendix).[3]

2 Notwithstanding the above, existing materials stowed on board before 1 January 2024 are not prohibited from being retained on board but should not be installed unless they can be documented to be asbestos-free before use/installation.

3 During surveys required by the 1979, 1989 and 2009 MODU Codes, the Administration or recognized organization acting on their behalf in consultation with the person responsible to control asbestos-containing material on board, should:

.1 audit available documentation, including asbestos-free declarations and other supporting documentation, based on the *Guidelines for maintenance and monitoring of onboard materials which contain asbestos on board MODUs* (MSC.1/Circ.[…]); and

.2 verify that materials which are documented to contain asbestos, as prohibited by regulation 2.10.3 of the 2009 MODU Code, regulation 2.8.2 of the 1989 MODU Code and regulation 2.7.2 of the 1979 MODU Code, have not been installed on board after 1 January 2024.

[1] "Materials which contain asbestos" means that asbestos is present in the product/material above the threshold value stipulated in row A-1 of table A of appendix 1 to resolution MEPC.269(68).

[2] Working parts here means product/material as listed in resolution MEPC.269(68)) in the structure, machinery, electrical installations and equipment covered by the 1979, 1989 and 2009 MODU Codes.

[3] The list of structures and/or equipment in the appendix is intended to show examples and should not be seen as exclusive.

**APPENDIX**

| Structure and/or equipment | Component |
|---|---|
| Propeller shafting | Packing with low pressure hydraulic piping flange<br>Packing with casing<br>Clutch<br>Brake lining<br>Synthetic stern tubes |
| Diesel engine | Packing with piping flange<br>Lagging material for fuel pipe<br>Lagging material for exhaust pipe<br>Lagging material turbocharger |
| Turbine engine | Lagging material for casing<br>Packing with flange of piping and valve for steam line, exhaust line and drain line<br>Lagging material for piping and valve of steam line, exhaust line and drain line |
| Boiler | Insulation in combustion chamber<br>Packing for casing door<br>Lagging material for exhaust pipe<br>Gasket for manhole<br>Gasket for hand hole<br>Gas shield packing for soot blower and other hole<br>Packing with flange of piping and valve for steam line, exhaust line, fuel line and drain line<br>Lagging material for piping and valve of steam line, exhaust line, fuel line and drain line |
| Exhaust gas economizer | Packing for casing door<br>Packing with manhole<br>Packing with hand hole<br>Gas shield packing for soot blower<br>Packing with flange of piping and valve for steam line, exhaust line, fuel line and drain line<br>Lagging material for piping and valve of steam line, exhaust line, fuel line and drain line |
| Incinerator | Packing for casing door<br>Packing with manhole<br>Packing with hand hole<br>Lagging material for exhaust pipe |
| Auxiliary machinery (pump, compressor, oil purifier, crane) | Packing for casing door and valve<br>Gland packing<br>Brake lining |
| Heat exchanger | Packing with casing<br>Gland packing for valve<br>Lagging material and insulation |
| Valve | Gland packing with valve, sheet packing with piping flange<br>Gasket with flange of high pressure and/or high temperature |
| Pipe, duct | Lagging material and insulation |
| Tank (fuel tank, hot water, tank, condenser), other equipment | Lagging material and insulation |

| Structure and/or equipment | Component |
|---|---|
| (fuel strainer, lubricant oil strainer) | |
| Electric equipment | Insulation material |
| Airborne asbestos | Wall, ceiling |
| Ceiling, floor and wall in accommodation area | Ceiling, floor, wall |
| Fire door | Packing, construction and insulation of the fire door |
| Inert gas system | Packing for casing, etc. |
| Air conditioning system | Sheet packing, lagging material for piping and flexible joint |
| Miscellaneous | Ropes<br>Thermal insulating materials<br>Fire shields/fire proofing<br>Space/duct insulation<br>Electrical cable materials<br>Brake linings<br>Floor tiles/deck underlay<br>Steam/water/vent flange gaskets<br>Adhesives/mastics/fillers<br>Sound damping<br>Moulded plastic products<br>Sealing putty<br>Shaft/valve packing<br>Electrical bulkhead penetration packing<br>Circuit breaker arc chutes<br>Pipe hanger inserts<br>Weld shop protectors/burn covers<br>Fire-fighting blankets/clothing/equipment<br>Concrete ballast<br>Brake shoes<br>Coating materials<br>Insulation materials<br>Seals |

***

**ANNEX 8**

**DRAFT MSC CIRCULAR**

**GUIDELINES FOR MAINTENANCE AND MONITORING OF MATERIALS CONTAINING ASBESTOS ON BOARD MODUs**

1 The Maritime Safety Committee, at its [107th] session (31 May to 9 June 2023), having considered the *Guidelines for maintenance and monitoring of onboard materials containing asbestos* (MSC/Circ.1045) as the basis for the development of similar recommendations for MODUs, approved the Guidelines for maintenance and monitoring of materials containing asbestos on board MODUs, prepared by the Sub-Committee on Ship Design and Construction (SDC) at its ninth session (23 to 27 January 2023), as set out in the annex.

2 The Guidelines are intended to provide guidance to Administrations, owners, companies, operating personnel and others closely involved with the operation of mobile offshore drilling units (MODUs) on how to deal with asbestos on board MODUs in service, under repair/modification/conversion and alteration with the principal objective of minimizing exposure to asbestos fibres of operating personnel, maintenance and repair personnel and any other persons.

3 Member Governments are invited to use the annexed Guidelines when dealing with asbestos on board MODUs and to bring them to the attention of all parties concerned.

ANNEX

# GUIDELINES FOR MAINTENANCE AND MONITORING OF MATERIALS CONTAINING ASBESTOS ON BOARD MODUs

## 1 Introduction

1.1 These Guidelines aim at providing guidance to Administrations, owners, companies as defined in SOLAS regulation IX/1, operating personnel and others closely involved with the operation of MODUs on how to deal with asbestos on board MODUs in service.

1.2 They do not intend to address other aspects of asbestos that are already covered by the work of other international organizations, as set out in annex 2.

## 2 Scope of application

2.1 These Guidelines apply to MODUs which have asbestos or materials containing asbestos on board.

2.2 The purpose of the Guidelines is to set up a maintenance and monitoring programme with the principal objective of minimizing exposure to asbestos fibres of anyone on board (owners, operating personnel, maintenance and repair personnel) while the MODU is in service and under repair/modification/conversion/alteration, etc.

2.3 Planned repairs or removal of such materials should be carried out by special personnel. In cases where the MODU crews and/or personnel are involved in urgent repair work, special measures should be observed as listed in annex 1. Procedures should be developed for the safe retention of any waste asbestos on board the MODU and eventual safe disposal ashore.

## 3 General provision

Provisions should be established, including the nomination of a responsible person to control the maintenance and monitoring of onboard materials containing asbestos in line with the provisions of the present Guidelines.

## 4 Inventory and condition assessment of asbestos-containing materials

4.1 An initial inspection of the MODU should be performed by a qualified professional to investigate the possible presence of asbestos-containing materials on board and, if any are identified, to locate them and assess their condition. The inspection should serve as the basis for establishing an effective maintenance and monitoring programme for dealing with the asbestos in the MODU.

4.2 In the case of flake coatings, lagging or false ceilings containing asbestos, their condition should be assessed by completing the evaluation checklist shown in appendix 1 to annex 1, which takes into account, in particular, the accessibility of the materials and products, their degree of degradation, their exposure to shocks and vibration and the presence of air currents in the area. Air sampling of dust measurement may be used as one tool to help provide a more complete assessment of the ambient conditions on board. The evaluation form contained in appendix 2 to annex 1 should be used to make the diagnosis on the state of conservation of these materials.

## 5 Maintenance and monitoring programme

5.1 If asbestos-containing material is located, a maintenance and monitoring programme should be developed for that MODU, based on the inspection and assessment data. The programme should be implemented and managed conscientiously and include the elements contained in annex 1.

5.2 In the case of flake coatings, lagging or false ceilings containing asbestos, depending on the diagnosis as described in paragraph 4.2, appropriate thresholds and timescales should be established for undertaking any necessary repairs or abatement, taking into account any national regulations.

## 6 Abatement actions, planned repair and removal of asbestos-containing materials

6.1 Abatement actions should be selected and implemented when necessary. In some instances, due to the condition of asbestos-containing materials or upcoming repairs or modifications, other abatement actions may be taken to deal with asbestos-containing materials in the MODU. These response actions could include encapsulation (covering the asbestos-containing materials with a sealant to prevent fibre release), enclosure (placing an airtight barrier around the asbestos-containing materials), encasement (covering the asbestos-containing materials with a hard-setting sealing material) or repair or removal of the asbestos-containing materials. Qualified, trained and experienced contractors should be used for any of these actions. Any national and local regulations that pertain to abatement actions to deal with asbestos-containing materials should be identified and taken into account.

6.2 In the event of works requiring the removal of asbestos-containing materials, they should be unloaded from the MODU. On completion of the work, and before any restoration of the spaces, dust measurement should be carried out after dismantling the enclosing mechanism. If the work does not result in the total removal of the materials and products listed in this order, regular surveillance of the asbestos-containing materials should be carried out at appropriate intervals, but not exceeding three years.

ANNEX 1

## MAINTENANCE AND MONITORING PROGRAMME

A successful maintenance and monitoring programme should include the following elements.

### 1 Notification

A programme through which all those affected will be informed where asbestos-containing material is located, and how and why to avoid disturbing the asbestos-containing material.

### 2 Surveillance

Regular surveillance of asbestos-containing material to note, assess and document any changes in the condition of the asbestos-containing material.

### 3 Controls

The maintenance and monitoring programme should include a system to control all work that could disturb asbestos-containing material.

### 4 Work practices

A maintenance and monitoring programme should focus on a special set of work practices. The nature and extent of any special work practices should be tailored to the likelihood that the asbestos-containing material will be disturbed and that fibres will be released. In general, four broad categories of work practices are recognized:

.1 protection programmes to ensure MODU crews and personnel are adequately protected from asbestos exposure during normal maintenance;

.2 basic operations and maintenance procedures to minimize and/or contain asbestos fibres;

.3 special operations and maintenance cleaning techniques to clean up asbestos fibres on a routine basis; and

.4 procedures for use during incidents of asbestos fibre release episodes to minimize the spread throughout the MODU.

In the latter case, the procedures to be followed will vary according to the site of the major release episode, the amount of asbestos-containing material affected, the extent of fibre release from the asbestos-containing material, the relationship of the asbestos-containing material to the air handling systems, and whether the release site is accessible to MODU crews and personnel.

### 5 Record-keeping

All MODU asbestos management documents should be stored in permanent files. In addition, for MODU crews and personnel engaged in asbestos-related work there may be national regulations that require employers to retain medical records, health records and personal air sampling records for each member of the crew or personnel, and provision should be made to comply with such regulations.

## 6 Training

Training of maintenance personnel is one of the keys to a successful maintenance and monitoring programme. Inadequate training of personnel may result in asbestos operations and maintenance tasks not being performed properly, possibly leading to higher than necessary levels of asbestos fibres in the air and an increased risk being faced by MODU crews and personnel. The level of training may vary from:

.1 awareness training for personnel involved in activities where asbestos-containing materials may be accidentally disturbed;

.2 special operations and maintenance training for personnel involved in general maintenance and incidental repair tasks involving asbestos-containing material; and

.3 abatement worker training for workers who may conduct asbestos abatement. This level of work should not normally be expected of MODU crews or personnel.

## APPENDIX 1

## EVALUATION CHECKLIST
***Where asbestos is present in flake coating, lagging or false ceilings***
(to be completed for each compartment)

| | |
|---|---|
| Name of MODU | |
| Date of check | |
| Compartment | |
| Stated destination of compartment | |

| **Depending on diagnosis (see appendix 2)** | |
|---|---|
| 1 | Periodic check of state of conversation of materials |
| 2 | Monitoring of dust levels |
| 3 | Works |

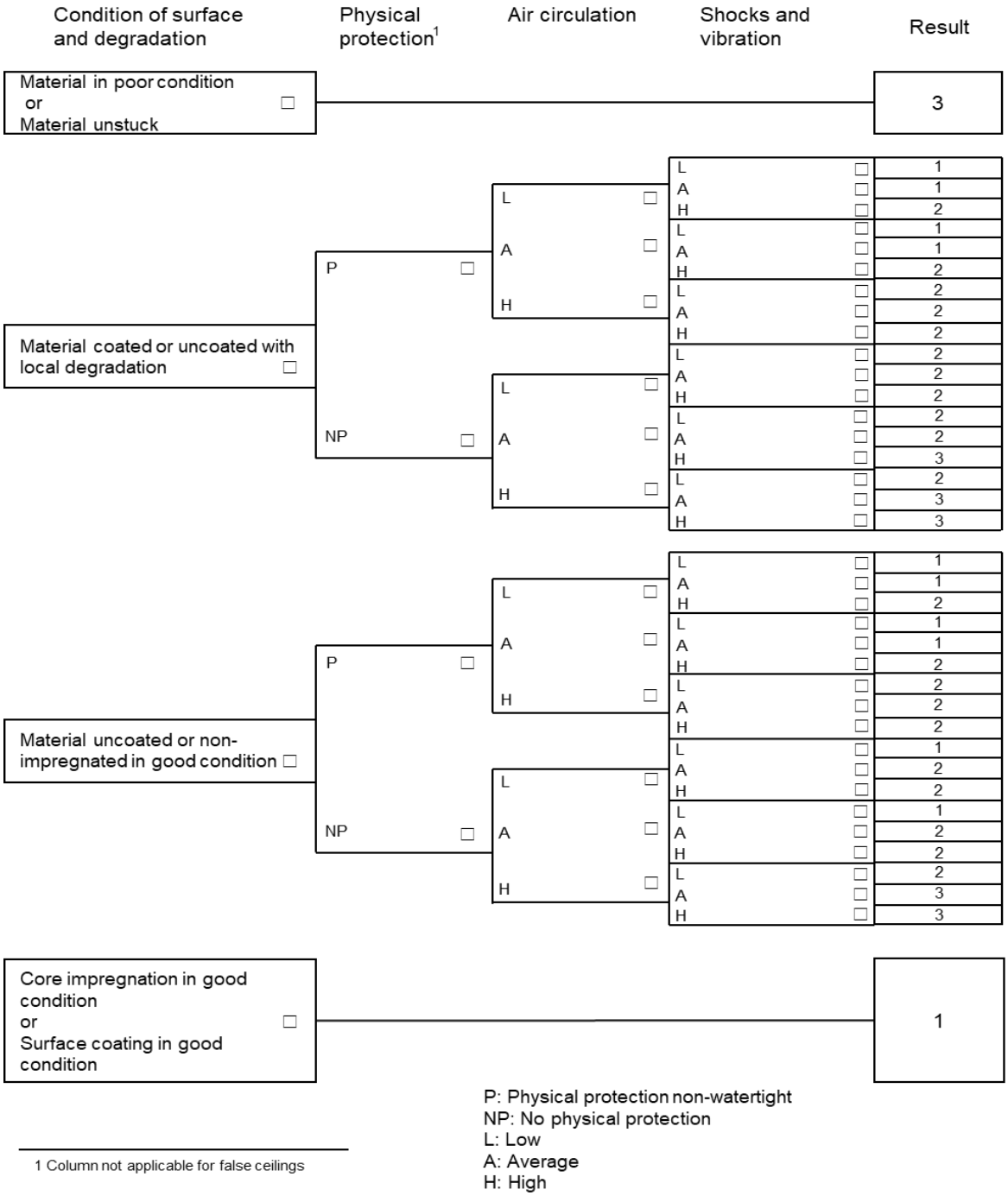
| **Characteristics of protection** | | |
|---|---|---|
| Watertight | □ | 1 |
| Non-watertight | □ | As indicated in appendix 2 |

TABLE OF CRITERIA USED IN THE DIAGNOSTIC CHECKLIST

| **FLAKE COATING** | **LAGGING** | **FALSE CEILINGS** |
|---|---|---|
| **Condition of surface and degradation**<br><br>Material in poor condition or material unstuck<br>Material coated or uncoated with local degradation<br>Material uncoated non-impregnated in good condition<br>Core impregnation in good condition or surface coating in good condition | **State of degradation**<br><br>Lagging in poor condition<br>Lagging with local degradation<br>Lagging in good condition | **Condition of surface and degradation**<br><br>Product in poor condition<br>Product with local degradation<br>Product in good condition |
| **Reported protection of the material**<br><br>Physical protection non-watertight<br><br>No physical protection | | |
| **Exposure of product to air current**<br>(including, depending on the situation plenum, false ceiling, etc.)<br>Low<br>Average<br>High | | |
| **Exposure of product to shocks and vibrations**<br>Low<br>Average<br>High | | |

## APPENDIX 2

## EVALUATION OF THE STATE OF CONSERVATION OF FLAKE COATING, LAGGING OR FALSE CEILINGS




P: Physical protection non-watertight
NP: No physical protection
L: Low
A: Average
H: High

1 Column not applicable for false ceilings

ANNEX 2

## CONTACT DETAILS OF INTERNATIONAL ORGANIZATIONS WHICH HAVE ADDRESSED ASBESTOS-RELATED ISSUES

### International Labour Office (ILO)

| | |
|---|---|
| Address: | 4, route des Morillons<br>CH-1211 Geneva 22<br>Switzerland |
| Tel: | + 41 22 799 6111 |
| Fax: | + 41 22 798 8685 |
| Website: | www.ilo.org |

### World Health Organization (WHO)

| | |
|---|---|
| Address: | Avenue Appia 20<br>CH-1211 Geneva 27<br>Switzerland |
| Tel: | + 41 22 791 2111 |
| Fax: | + 41 22 791 3111 |
| Website: | www.who.org |

***

# ANNEX 9

## DRAFT AMENDMENTS TO SOLAS REGULATION II-1/3-4

## CHAPTER II-1

## CONSTRUCTION – STRUCTURE, SUBDIVISION AND STABILITY, MACHINERY AND ELECTRICAL INSTALLATIONS

## PART A-1
## STRUCTURE OF SHIPS

### Regulation II-1/3-4 – Emergency towing arrangements and procedures

1 The following new section 2 is added after section 1:

**"2 Emergency towing arrangements on ships other than tankers**

2.1 Emergency towing arrangements shall be fitted on ships other than tankers of not less than 20,000 gross tonnage, constructed on or after [entry-into-force date].

2.2 For ships other than tankers constructed on or after [entry-into-force date]:

.1 the arrangements shall, at all times, be capable of rapid deployment in the absence of main power on the ship to be towed and easy connection to the towing ship; and

.2 emergency towing arrangements shall be of adequate strength taking into account the size of the ship, and the expected forces during bad weather conditions. The design and construction and prototype testing of emergency towing arrangements shall be approved by the Administration, based on the Guidelines developed by the Organization.*

* Refer to Guidelines on emergency towing arrangements for ships other than tankers ([to be developed])."

2 Renumber subsequent paragraphs in the existing section 2 under renumbered section 3.

**CHECK/MONITORING SHEET FOR THE PROCESS OF AMENDING THE CONVENTION AND RELATED MANDATORY INSTRUMENTS (PROPOSAL/DEVELOPMENT)**

**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. | Yes |
| 4 | Due attention has been paid to the *Interim guidelines for the systematic application of the grandfather clauses* (MSC/Circ.765-MEPC/Circ.315). | N/A |
| 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. | N/A |
| 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 |
| 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). | No (to be completed) |
| 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. | No (to be completed) |
| 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**

| | |
|---|---|
| **1** | **Title (number and title of regulation(s))** |
| SOLAS regulation II-1/3-4 | |
| **2** | **Origin of the requirement (original proposal document)** |
| MSC 102/21/5 and Corr.1 (France et al.) | |
| **3** | **Main reason for the development (extract from the proposal document)** |
| MSC 102/21/5 and Corr.1 (France et al.) proposing an extension of the requirements for emergency towing arrangements in SOLAS regulation II-1/3-4, applicable to tankers of not less than 20,000 tonnes deadweight, to all types of large new ships. | |
| **4** | **Related output** |
| Development of amendments to SOLAS regulation II-1/3-4 to apply requirements for emergency towing equipment for tankers to other types of ships. | |
| **5** | **History of the discussion (approval of work programmes, sessions of sub-committees, including CG/DG/WG arrangements)** |
| MSC 103 agreed to include in the biennial agenda of the SDC Sub-Committee for 2022-2023 and the provisional agenda for SDC 8 an output on "Development of amendments to SOLAS regulation II-1/3-4 to apply requirements for emergency towing equipment for tankers to other types of ships", with a target completion year of 2023. | |
| **6** | **Impact on other instruments (codes, performance standards, guidance circulars, certificates/records format, etc.)** |
| A new set of guidelines for emergency towing arrangements on ships other than tankers to be developed as a consequence of the SOLAS amendments. | |
| **7** | **Technical background** |
| ***7.1*** | ***Scope and objective (to cross check with items 4 and 5 in part II of the checklist)*** |
| Amendments to SOLAS applicable to new ships other than tankers of not less than 20,000 GT (and to which SOLAS chapter I applies) | |
| ***7.2*** | ***Technical/operational background and rationale (e.g. summary of FSA study, if available, or engineering challenge posed)*** |
| Application of similar requirements to all kind of ships other than tankers meets challenges in developing new requirements and associated guidelines, for which an extension of output is requested. | |
| ***7.3*** | ***Source/derivation of requirement (non-mandatory instrument, industry standard, national/regional requirement)*** |
| Experiences gained and feedback received | |
| ***7.4*** | ***Short summary of requirement (what is the new requirement – in short and lay terms)*** |
| Extension of requirement for emergency towing arrangements to new ships of not less than 20,000 GT | |
| ***7.5*** | ***Points of discussions (controversial points and conclusion)*** |
| New design and operational requirements for ships other than tankers should be carefully considered taking into account differences in ship design and operational profiles.<br>Need for further consideration of associated guidelines. | |

***

**ANNEX 10**

**DRAFT MSC CIRCULAR**

**UINIFIED INTERPRETATION OF SOLAS REGULATION II-1/1.1.3**

1 The Maritime Safety Committee, at its [107th session (31 May to 9 June 2023)], approved *Unified interpretation of SOLAS regulation II-1/1.1.3*, prepared by the Sub-Committee on Ship Design and Construction, at its ninth session, as set out in the annex.

2 Member States are invited to apply the annexed unified interpretations and to bring them to the attention of all parties concerned.

ANNEX

## UINIFIED INTERPRETATION OF SOLAS REGULATION II-1/1.1.3

**SOLAS regulation II-1/1.1.1, as amended by resolution MSC.436(99) reads as follows:**

"Unless expressly provided otherwise, parts B, B-1, B-2 and B-4 of this chapter shall only apply to ships:

.1 for which the building contract is placed on or after 1 January 2020; 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 2020; or

.3 the delivery of which is on or after 1 January 2024.".

**SOLAS regulation II-1/1.1.2, as amended by resolution MSC.436(99) reads as follows:**

"Unless expressly provided otherwise, for ships not subject to the provisions of sub-paragraph 1.1.1 but constructed on or after 1 January 2009, the Administration shall:

.1 ensure that the requirements for parts B, B-1, B-2 and B-4 which are applicable under chapter II-1 of the International Convention for the Safety of Life at Sea, 1974, as amended by resolutions MSC.216(82), MSC.269(85) and MSC.325(90) are complied with; and

.2 ensure that the requirements of regulations 8-1.3 and 19-1 are complied with."

**SOLAS regulation II-1/1.1.3, as amended by resolution MSC.474(102) reads as follows:**

"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 ships:

.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.

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

.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."

**SOLAS regulation II-1/25-1.1, as amended by resolution MSC.482(103) reads as follows:**

"Multiple hold cargo ships other than bulk carriers and tankers constructed on or after 1 January 2024 shall be fitted with water level detectors in each cargo hold intended for dry cargoes. Water level detectors are not required for cargo holds located entirely above the freeboard deck.".

**Interpretation**

1 The expression "ships constructed before 1 January 2024" with respect to ships subject to the provisions of SOLAS regulation II-1/1.1.1.1 should mean:

.1 ships with a contract for construction date on or after 1 January 2020 but before 1 January 2024 subject to compliance with .3 below; or

.2 ships without a contract for construction, having a keel laying date, or similar stage of construction date, on or after 1 July 2020 but before 1 July 2024 subject to compliance with .3 below; and

.3 ships with a date of delivery on or after 1 January 2024 but before 1 January 2028, provided the condition in .1 or .2 above, as applicable, is met.

2 The expression "Multiple hold cargo ships other than bulk carriers and tankers constructed on or after 1 January 2024" as used in SOLAS regulation II-1/25-1 (as amended by resolution MSC.482(103)) should be interpreted as follows:

"Multiple hold cargo ships other than bulk carriers and tankers constructed on or after 1 January 2024" should be subject to the definition of "ships constructed on or after 1 January 2024" in SOLAS regulation II-1/1.1.3.2 (as amended by resolution MSC.474(102))."

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**ANNEX 11**

**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 (2008 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.

2 The Maritime Safety Committee, at its 101st session (5 to 14 June 2019), approved amendments to MSC.1/Circ.1537 to include revisions of the unified interpretations of section 2.3 (Severe wind and rolling criterion (weather criterion)), as well as of section 3.4.2 (Assumptions for calculating loading conditions), prepared by the Sub-Committee on Ship Design and Construction, at its sixth session. ~~The amended text of the Unified Interpretations is set out in the annex.~~

3 The Maritime Safety Committee, at its 107th session (31 May to 9 June 2023), approved amendments to MSC.1/Circ.1537/Rev.1, prepared by the Sub-Committee on Ship Design and Construction, at its ninth session, to clarify that the scope of application of the interpretation of the specific down-flooding points applied to the entire 2008 Intact Stability Code. The amended text of the unified interpretations is set out in the annex.

4 ~~3~~ Member States are invited to apply the annexed unified interpretations and to bring them to the attention of all parties concerned.

5 ~~4~~ This circular ~~supersedes~~ revokes MSC.1/Circ.1537/Rev.1.

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)***~~
***2.1 General***

*2 In applying $\varphi_f$,* 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, 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

### *Chapter 1 General*

*3 In applying $\varphi_f$, 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, 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.*

### *3.4.2 Assumptions for calculating loading conditions*

4 ~~3~~ For tankers assigned with a tropical load line, the ship should be assumed to be loaded 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 seawater density is 1.025 t/m$^3$.

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**ANNEX 12**

**DRAFT MSC CIRCULAR**

**UNIFIED INTERPRETATION OF SOLAS CHAPTER II-1**

1 The Maritime Safety Committee, at its eighty-seventh session (12 to 21 May 2010), with a view to providing more specific guidance for application of the relevant requirements of the 1974 SOLAS Convention, approved a unified interpretation of SOLAS regulation II-1/2.14, prepared by the Sub-Committee on Stability and Load Lines and on Fishing Vessels Safety, at its fifty-second session.

2 The Maritime Safety Committee, at its 105th session (20 to 29 April 2022), agreed to amend the above unified interpretation by incorporating interpretations for SOLAS regulations II-1/5.4 and II-1/5.5, prepared by the Sub-Committee on Ship Design and Construction, at its eighth session (17 to 21 January 2022).

3 The Maritime Safety Committee, at its [107th session (31 May to 9 June 2023)], in order to clarify the documentation which is necessary to support an Administration or a recognized organization (RO) in verifying compliance with SOLAS regulation II-1/3-8, as well as to provide clarification for pressure testing of penetrations in watertight divisions after a fire test (SOLAS regulation II-1/13.2.3), approved amendments to MSC.1/Circ.1362/Rev.1, prepared by the Sub-Committee on Ship Design and Construction at its ninth session.

4 ~~3~~ Member Governments are invited to use the annexed unified interpretations as guidance when applying relevant provisions of SOLAS chapter II-1 and to bring them to the attention of all parties concerned.

5 ~~4~~ This circular revokes MSC.1/Circ.1362/Rev.1.

ANNEX

**UNIFIED INTERPRETATION OF SOLAS ~~REGULATIONS~~ II-1~~/5.4 AND II-1/5.5, RELATING TO THE AMENDMENT TO THE STABILITY/LOADING INFORMATION IN CONJUNCTION WITH THE ALTERATIONS OF LIGHTWEIGHT~~**

**Regulation 2.14 – Definitions**

For ships constructed on or after 21 May 2010: In determining the permeability of a space, the volume of a space should be taken as the moulded volume, i.e. the immersed volume of a space should be the underwater moulded volume of that space multiplied by the permeability.

**Regulation 3-8**

SOLAS regulation II-1/3-8, as amended by resolution MSC.474(102) reads:

"**Regulation 3-8**
*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 1 January 2024; 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 1 July 2024; or

.3 the delivery of which is on or after 1 January 2027.

3 This regulation does not apply to towing arrangements provided in accordance with regulation 3-4.

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.

5 Arrangements, equipment and fittings provided in accordance with paragraph 4 above shall meet the appropriate requirements of the Administration or an organization recognized by the Administration under regulation I/6.[1]

6 Each fitting or item of equipment provided under this regulation shall be clearly marked with any limitations associated with its safe operation, taking into account the strength of 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

[1] 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 1 January 2024 and the *Guidance on shipboard towing and mooring equipment* (MSC.1/Circ.1175/Rev.1) for ships constructed on or after 1 January 2024.

occupational safety and safe mooring of the ship, based on the guidelines developed by the Organization.[2] Ship-specific information shall be provided and kept on board.[3]

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.

9 For all ships, mooring equipment, including lines, shall be inspected and maintained in a suitable condition for their intended purposes."[4]

**Interpretation**

1 The expression "all ships" in SOLAS regulation II-1/3-8.9 means ships constructed before, on, or after 1 January 2009 in accordance with SOLAS regulation II-1/1.1.3.2.

2 Irrespective of the scope of review by the Administration or a recognized organization (RO), as clarified below, for ships covered by the application provisions described in SOLAS regulations II-1/3-8.1 and II-1/3-8.2, as amended by resolution MSC.474(102), owners and designers should comply with the:

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

.2 *Guidelines on the design of mooring arrangements and the selection of appropriate mooring equipment and fittings for safe mooring* (MSC.1/Circ.1619); and

.3 *Guidelines for inspection and maintenance of mooring equipment including lines* (MSC.1/Circ.1620),

footnoted in SOLAS regulation II-1/3-8, in its entirety, and ensure that appropriate measures are taken to mitigate any occupational risks arising from deviations.

3 While applying the requirements of SOLAS regulation II-1/3-8.4 to regulation II-1/3-8.6 and SOLAS regulation II-1/3-8.8, for ships of less than 3,000 gross tonnage, the following is recommended:

.1 the "Towing and mooring arrangements plan" should be provided for information, where the winch brake holding capacities should be included in addition to the information provided in section 5 (Towing and mooring arrangements plan) of the annex to MSC.1/Circ.1175/Rev.1. A technical specification document of the mooring lines supplied with the ship should be provided for information. The manufacturers' recommended minimum diameter D of each fitting in contact with the mooring lines and the Line Design Break Force (LDBF) of the mooring lines should be included in the document;

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[2] 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.1619).

[3] Refer to towing and mooring arrangement plan in the *Guidelines on the design of mooring arrangements and the selection of appropriate mooring equipment and fittings for safe mooring* (MSC.1/Circ.1619).

[4] Refer to the *Guidelines for inspection and maintenance of mooring equipment including lines* (MSC.1/Circ.1620)."

.2 for confirmation of the appropriate selection of mooring line, the properties of mooring lines related to LDBF and bend radius (D/d ratio) should be submitted to the Administration or the RO. A warning should be provided that the wear rate of lines may be higher for lower diameter (paragraph 5.6 of MSC.1/Circ.1620); and

.3 at delivery of the ship, the Administration or the RO should confirm that the towing and mooring arrangements plan is provided on board.

4 While applying the requirements of SOLAS regulation II-1/3-8.4 to regulation II-1/3-8.6 and the SOLAS regulation II-1/3-8.7, for ships of 3,000 gross tonnage and above, the following is recommended in addition to those specified under paragraph 3 of this interpretation:

.1 a document should be provided by the designer for information and as a supplement to the towing and mooring arrangements plan, confirming that MSC.1/Circ.1619 has been considered. The document should explicitly state that the deviations, if any, were unavoidable;

.2 deviations should be recorded (paragraph 6.1 of MSC.1/Circ.1619), justification and suitable safety measures should be provided (paragraph 6.2 of MSC.1/Circ.1619) in the supplement to the towing and mooring arrangements plan. A reference to the supplement should be included in the towing and mooring arrangements plan (paragraph 6.3 of MSC.1/Circ.1619);

.3 if deviations are not found necessary, and the supplement is not needed, then this should be mentioned explicitly in the towing and mooring arrangements plan;

.4 the mooring winches' brake holding capacities should be less than 100% of the Ship Design Minimum Breaking Load ($MBL_{SD}$) (paragraphs 5.2.3.3 and 5.2.4 of MSC.1/Circ.1619). The winches should be fitted with brakes that allow for the reliable setting of the brake rendering load; and

.5 at delivery of the ship, the Administration or the RO should confirm that the towing and mooring arrangements plan and the supplement describing deviations and suitable safety measures is provided on board.

5 While applying the requirements of SOLAS regulation II-1/3-8.9, the following should be complied with, and compliance should be confirmed by the surveyor at the initial survey for new ships or at the first annual survey for the issuance of the Cargo Ship Safety Construction Certificate or renewal survey for the issuance of the Passenger Ship Safety Certificate after 1 January 2024 for existing ships:

.1 procedures for mooring operations, inspection and maintenance of mooring equipment, including mooring lines, should be established and available on board (paragraph 3.1 of MSC.1/Circ.1620), taking into account industry practices (section 7 of MSC.1/Circ.1620);

.2 procedures to allow the identification and control of mooring lines, tails and associated attachments should be established and available on board (paragraph 3.3 of MSC.1/Circ.1620);

.3 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 (paragraph 4.1.1 of MSC.1/Circ.1620);

.4 manufacturers' criteria for replacement of mooring lines should be available (paragraph 4.3.1 of MSC.1/Circ.1620);

.5 records of the original design concept, equipment, arrangements and specifications should be available on board (paragraph 4.4.4 of MSC.1/Circ.1620). For ships the keels of which were laid before 1 January 2007 and without appropriate documentation, owners may establish the $MBL_{SD}$ for mooring based on the safe working load of mooring equipment provided on board. If no safe working load is specified, then owners are advised to check strength of mooring equipment and their supporting hull structure based on MSC.1/Circ.1175/Rev.1 and determine $MBL_{SD}$ based on actual capacity of the equipment and their supporting hull structure on board. Manufacturers' test certificates for mooring lines, joining shackles and synthetic tails should be kept on board and properly linked back to the equipment, if available (paragraph 6.2 of MSC.1/Circ.1620); and

.6 a document should be provided on board for gathering the information above and describe how the information listed above is filed and collected.

6 While applying the requirements of SOLAS regulation II-1/3-8.9, the following should be complied with, and the compliance should be confirmed by the surveyor at the periodical survey for endorsement/issue of the Cargo Ship Safety Construction Certificate or the renewal survey for the Passenger Ship Safety Certificate after 1 January 2024 for existing ships:

.1 the records of inspection and maintenance of mooring equipment and inspection and replacement of mooring lines, since the last periodical survey, should be kept updated and available on board (paragraphs 4.4.3 and 6.1 of MSC.1/Circ.1620).

**Regulations 5.4 and 5.5**

SOLAS regulations II-1/5.4 and II-1/5.5 read:

"**Regulation 5**
*Intact stability*

…

4 Where any alterations are made to a ship so as to materially affect the stability information supplied to the master, amended stability information shall be provided. If necessary, the ship shall be re-inclined. The ship shall be re-inclined if anticipated deviations exceed one of the values specified in paragraph 5.

5 At periodical intervals not exceeding five years, a lightweight survey shall be carried out on all passenger ships to verify any changes in lightship displacement and longitudinal centre of gravity. The ship shall be re-inclined whenever, in comparison with the approved stability information, a deviation from the lightship displacement exceeding 2% or a deviation of the longitudinal centre of gravity exceeding 1% of L is found or anticipated."

**Revised Explanatory Notes to SOLAS regulation II-1/5.4 (resolutions MSC.429(98)/Rev.1 and Rev.2) read:**

"Regulation 5.4

1 When alterations are made to a ship in service that result in calculable differences in the lightship properties, a detailed weights and centres of gravity calculation to adjust the lightship properties should be carried out. If the adjusted lightship displacement or longitudinal centre of gravity, when compared to the approved values, exceeds one of the deviation limits specified in regulation 5.5, the ship should be re-inclined. In addition, if the adjusted lightship vertical centre of gravity, when compared to the approved value, exceeds 1%, the ship should be re-inclined. The lightship transverse centre of gravity is not subject to a deviation limit.

2 When a ship does not exceed the deviation limits specified in explanatory note 1 above, amended stability information should be provided to the master using the new calculated lightship properties if any of the following deviations from the approved values are exceeded:

.1 1% of the lightship displacement; or

.2 0.5% of L for the longitudinal centre of gravity; or

.3 0.5% of the vertical centre of gravity.

However, in cases when these deviation limits are not exceeded, it is not necessary to amend the stability information supplied to the master.

3 When multiple alterations are made to a ship in service over a period of time and each alteration is within the deviation limits specified above, the cumulative total changes to the lightship properties from the most recent inclining also should not exceed the deviation limits specified above or the ship should be re-inclined."

**Interpretation**

***Definition of lightweight calculation***

For the purposes of this interpretation, the term "lightweight calculation" means a detailed calculation of weights on and weights off a ship, resulting from all alterations to the ship since the date of the last approved inclining test, to determine the adjusted lightship properties. Lightship properties include weights and the centre of gravity. The documented weights and their centres of gravity should be verified on board/on-site by the attending class surveyor.

When weights are added, removed or relocated, the final cumulative change is to be compared to the last approved inclining test.

"*Lightweight survey*" is defined in the International Code on Intact Stability 2008, paragraph 2.24.

***Definition of stability information***

"*Stability information*" includes any document (whether on paper or electronic) or electronic means of calculation of stability which includes lightship properties. This could include, but is not limited to, the approved stability book, computer software for onboard calculation of stability, the approved strength book and the loading instrument.

***Amendment of stability information in conjunction with alterations of lightship properties***

1 If the lightweight calculation, regardless of keel laying date, shows a deviation in lightweight mass, or the longitudinal or vertical position of the centre of gravity:

.1 beyond any of the tolerance limits specified in explanatory note 1 to SOLAS regulation II-1/5.4 (resolutions MSC.429(98)/Rev.1 and Rev.2), then the ship should be re-inclined and the stability information, as defined above, should be updated to reflect the lightship properties derived from the inclining test and should be approved;

.2 within the tolerance limits specified in the explanatory note 1 and exceeding any of the deviations specified in explanatory note 2 to SOLAS regulation II-1/5.4 (resolutions MSC.429(98)/Rev.1 and Rev.2), then the stability information should be updated to reflect the lightship properties derived from the lightweight calculation and should be approved; or

.3 within the tolerance limits specified in explanatory note 2 to SOLAS regulation II-1/5.4 (resolutions MSC.429(98)/Rev.1 and Rev.2), then a copy of the endorsed lightweight calculation report should be provided on board for future reference with no further amendments required to the stability information. However, even if addition, removal or relocation of any weight results in lightship particulars being within tolerable limits, that weight should still be noted and the "constant" adjusted for lightweight calculation in the stability information for all future references and calculations.

2 A summary of paragraph 1 of this interpretation is provided in the following table. Where stability information is to be updated, it should be approved and provided to the master with the instruction that it should now be used for all stability calculations.

| **Scenario, as calculated by lightweight calculation** | **Requirement for Inclining Test** | **Update of Stability Information** |
|---|---|---|
| Lightweight change > 2% | Yes | Yes, using new incline result |
| LCG change > 1% of L (either forward or aft) | Yes | Yes, using new incline result |
| VCG change > 1% | Yes | Yes, using new incline result |
| | | |
| 1% < Lightweight change ≤ 2% | No | Yes, using lightweight calculation |
| 0.5% of L < LCG change ≤ 1% of L (either forward or aft) | No | Yes, using lightweight calculation |
| 0.5% < VCG change ≤ 1% | No | Yes, using lightweight calculation |
| | | |
| Lightweight change ≤ 1% | No | No |
| LCG change ≤ 0.5% of L (either forward or aft) | No | No |
| VCG change ≤ 0.5% | No | No |

3 Lightship properties should be consistent in all documents which use them, e.g. loading manual, stability manual and computer data.

4 A change in lightweight will result in a change in deadweight unless there is an associated change in freeboard. The consequences of the change could have an impact on compliance with other regulations, e.g. MARPOL Annex VI.

**Regulation 13**

SOLAS regulation II-1/13.2.3 reads:

"**Regulation 13**
*Openings in watertight bulkheads below the bulkhead deck in passenger ships*

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

**Interpretation**

1 Any penetration used for the passage of heat-sensitive piping systems through a watertight bulkhead or deck on a passenger ship under SOLAS regulation II-1/13.2.3 should be tested with the heat-sensitive piping and should be type approved for watertight integrity as per paragraphs 4 and 5 of the explanatory notes to regulation II-1/13.2.3 contained in the annex of resolutions MSC.429(98)/Rev.1 and Rev.2, as applicable, after the fire test.

2 SOLAS regulation II-1/13.2.3 should be applicable to heat-sensitive piping systems and should not be applied to cable penetrations in watertight bulkheads and decks.

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**ANNEX 13**

**DRAFT MSC RESOLUTION**

**REVISED PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON SHIPS SUBJECT TO SOLAS REGULATIONS II-1/25, II-1/25-1 AND XII/12**

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO resolution MSC.134(76), by which it, at its seventy-sixth session, adopted amendments to chapter XII of the International Convention for the Safety of Life at Sea (SOLAS), 1974, inter alia introducing new regulation 12 requiring the installation of water level detectors for hold, ballast and dry spaces,

RECALLING FURTHER resolution MSC.194(80), by which it, at its eightieth session, adopted amendments to chapter II-1 of the 1974 SOLAS Convention, introducing new regulation 23-3 requiring the installation of water level detectors on single hold cargo ships other than bulk carriers,

RECALLING resolution MSC.482(103), by which it, at its 103rd session, adopted amendments to chapter II-1 of the 1974 SOLAS Convention, introducing new regulation 25-1 requiring the installation of water level detectors on multiple hold cargo ships other than bulk carriers and tankers, which is expected to enter into force on 1 January 2024,

RECOGNIZING that performance standards against which the operation and efficiency of water level detectors can be measured should be made available in good time before the above entry-into-force date,

RECOGNIZING ALSO the need to ensure that the required water level detectors operate reliably and that, to that extent, they are appropriately tested and installed,

HAVING CONSIDERED, at its 105th session, the recommendations made by the Sub-Committee on Ship Design and Construction, at its eighth session,

HAVING ALSO CONSIDERED, at its 107th session, the recommendations made by the Sub-Committee on Ship Design and Construction, at its ninth session,

1 ADOPTS the Revised performance standards for water level detectors on ships subject to SOLAS regulations II-1/25, II-1/25-1 and XII/12 and the appended *Guidelines on installation and testing of water level detection systems for ships subject to SOLAS regulations II-1/25, II-1/25-1 and XII/12*, as set out in the annex to the present resolution;

2 URGES Governments to ensure that the annexed Revised performance standards and appended Guidelines are applied when water level detectors are installed on ships flying their flags, in compliance with SOLAS regulations II-1/25, II-1/25-1 and XII/12, as appropriate;

3 RECOMMENDS Governments to ensure that water level detectors:

.1 if installed on or after 1 January 2024, conform to performance standards not inferior to those specified in the annex to the present resolution;

.2 if installed before 1 January 2024, conform to performance standards not inferior to those specified in the annex to resolution MSC.188(79);

4 DETERMINES that the present resolution ~~supersedes~~ revokes resolution MSC.188(79)/Rev.1.

ANNEX*

**REVISED PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON SHIPS SUBJECT TO SOLAS REGULATIONS II-1/25, II-1/25-1 AND XII/12**

1 Paragraph 2.2.2 of the appendix to the Revised performance standards is amended as follows:*

"2.2.2 The sensors should be located at the height specified in the regulations. These heights are to be measured from the upper surface of the inner bottom. ~~and~~

2.2.2.1 For bilge level sensors in SOLAS regulation II-1/25-1.3, ~~i~~if the bottom of the bilge well is below the upper surface of the inner bottom, ~~its~~ the heights of those sensors are to be measured from the bottom of the bilge well."

***

* To be disseminated at MSC.188(79)/Rev.2. Tracked changes are indicated using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.

# ANNEX 14

## STATUS REPORT FOR THE 2022-2023 BIENNIUM

| Sub-Committee on Ship Design and Construction (SDC) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Reference to 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 | 1.12 | Revision of the 1979, 1989 and 2009 MODU Codes and associated MSC circulars to prohibit the use of materials containing asbestos, including control of storage of such materials on board | 2023 | MSC | SDC | | Ongoing | [Completed] | MSC 105/20, para. 18.54; SDC 9/16, section 8 |
| 1. Improve implementation | 1.16 | Review of the 2014 Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life (MEPC.1/Circ.833) (2014 Guidelines) and identification of next steps | 2023 | MEPC | SDC | | | Ongoing | MSC 105/20, para. 15.23; SDC 8/18, section 14 and annex 11 SDC 9/16, section 5 |

| Sub-Committee on Ship Design and Construction (SDC) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Reference to 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 | 2.3 | Amendments to the IGF Code and development of guidelines for alternative fuels and related technologies | Continuous | MSC | HTW, PPR, SDC | CCC | No work requested | No work requested | MSC 94/21, paras.18.5 and 18.6; MSC 96/25, paras.10.1 to 10.3; MSC 97/22, para. 19.2; PPR 6/20, para. 3.39; MSC 102/24, para. 21.4; MSC 106/19, para. 16.42 |
| 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~~<br><br>Further development of the IP Code and associated guidance | ~~2022~~<br><br>[2025] | MSC | SDC | | | Ongoing | MSC 104/18, para. 11.5; MSC 105/20, section 15; MSC 106/19, section 3; new chapter XV of SOLAS 1974 (res. MSC.521(106) and IP Code by MSC.527(106)); SDC 5/15, section 7; SDC 6/13, section 6; SDC 7/16, section 6; SDC 8/18, section 4 and annexes 1 and 2 SDC 9/16, section 4 |
| Note: | SDC 9 requests MSC 107 to agree to extend the target completion year to 2025. | | | | | | | | |

| Sub-Committee on Ship Design and Construction (SDC) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Reference to 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 | 2.5 | Safety objectives and functional requirements of the Guidelines on alternative design and arrangements for SOLAS chapter II-1 ~~and III~~ | ~~2022~~ 2024 | MSC | SSE | SDC | Ongoing | Ongoing | MSC 82/24, para.3.92; MSC 98/23, annex 38; MSC 102/24, para. 19.16; MSC 105/20, paras. 15.13 and 18.54; SDC 8/18, section 9; SDC 9/16, section 7 |
| Note: | MSC 105 approved the recommendation of SDC 8 to retitle the output and the extension of the TCY to 2024. | | | | | | | | |
| 2. Integrate new and advancing technologies in the regulatory framework | 2.6 | Development of Explanatory Notes to the Interim guidelines on second generation intact stability criteria | 2022 | MSC | SDC | | Completed | N/A | MSC 85/26, paras. 12.7 and 23.42; MSC 102/24, para. 21.20 and annex 26; MSC 105/20, section 15; MSC.1/Circ.1652; SDC 5/15, section 6; SDC 6/13, section 5; SDC 7/16, section 5; SDC 8/18, para. 5.16 and annex 4 |

| Sub-Committee on Ship Design and Construction (SDC) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Reference to 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 | 2.8 | Development of guidelines for cold ironing of ships and consideration of amendments to SOLAS chapters II-1 and II-2 | 2023 | MSC | III / HTW / SDC | SSE | No work requested | No work requested | MSC 98/23, para. 20.36; SSE 7/21, section 11; HTW 8/16, section 15; SSE 8/20, section 18 |
| 2. Integrate new and advancing technologies in the regulatory framework | 2.20 | Development of amendments to SOLAS regulation II-1/3-4 to apply requirements for emergency towing equipment for tankers to other types of ships | 2023 | MSC | SDC | | | [Completed] | SDC 8/18, section 12; SDC 9/16, section 9 |
| Note: | SDC 9 requests MSC 107 to consider changing the output title to "Development of Guidelines for emergency towing arrangements for ships other than tanker" as consequential work (see output 2.8 in annex 2). | | | | | | | | |
| 6. Address the human element | 6.1 | Role of the human element | Continuous | MSC / MEPC | III / PPR / CCC / SDC / SSE / NCSR | HTW | No work requested | Ongoing | MSC 89/25, paras.10.10, 10.16 and 22.39 and annex 21; SDC 9/16, para. 15.15 |
| 6. Address the human element | 6.2 | Validated model training courses | Continuous | MSC / MEPC | III / PPR / CCC / SDC / SSE / NCSR | HTW | No work requested | No work requested | MSC 100/20, paras. 10.3 to 10.6 and 17.28; MSC 105/20, section 16 |

| Sub-Committee on Ship Design and Construction (SDC) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Reference to 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. Address the human element | 6.15 | Revision of resolution A.1050(27) to ensure the safety of personnel entering enclosed spaces on board ships | 2024 | MSC | III, HTW, PPR, SDC and SSE | CCC | | No work requested | MSC 101/24, para. 21.48; MSC 104/18, para.15.16; MSC 106/19, para.16.31. |
| Note: | MSC 106 agreed to include output 6.15 in the biennial agenda of the CCC Sub-Committee for 2022-2023, with SDC as one of the associated bodies. | | | | | | | | |
| 7. Ensure regulatory effectiveness | 7.1 | Unified interpretation of provisions of IMO safety, security, environment, facilitation, liability and compensation-related conventions | Continuous | MSC / MEPC / FAL / LEG | III / PPR / CCC / SDC / SSE / NCSR | | | Ongoing | MSC 76/23, para.20.3; MSC 78/26, para.22.12; SDC 8/18, section 10; SDC 9/16, section 10 |
| Note: | A 28 expanded the output to include all proposed unified interpretations of provisions of IMO safety, security, and environment-related conventions. | | | | | | | | |
| 7. Ensure regulatory effectiveness | 7.21 | Amendments to the 2011 ESP Code | Continuous | MSC | SDC | | Ongoing | Ongoing | MSC 92/26, para.13.31; SDC 8/18, section 6 and annex 5; SDC 9/16, section 6 |
| Note: | Regular updates to the 2011 ESP Code agreed by MSC 92 (MSC 92/26, paragraph 13.31) | | | | | | | | |

| Sub-Committee on Ship Design and Construction (SDC) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Reference to 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** |
| 7. Ensure regulatory effectiveness | 7.33 | Review of 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 | 2023 | MSC | HTW / SDC | SSE | No work requested | No work requested | MSC 97/22, para.19.19; MSC 98/23, para.12.42; MSC 106/19, para.16.54 |
| 7. Ensure regulatory effectiveness | 7.35 | Safety measures for non-SOLAS ships operating in polar waters | 2023 | MSC | NCSR | SDC | | Completed | MSC 98/23, paras.10.29, 20.31.1 and 20.31.2 and annex 38; MSC 99/22, paras.7.16 and 20.13.1; MSC 101/24, paras.7.6 and 7.9; MSC 102/24, paras.17.5 to 17.8; MSC 103/21, paras.15.1 to 15.4; MSC 105/20, para.18.54; MSC 106/19, para.13.9; SDC 6/13, section 8; SDC 7/16, section 4; SDC 8/18, section 3; |
| Note: | SDC 9 requests MSC 107 to put the output on its post-biennial agenda (SDC 8/16, section 3) | | | | | | | | |

| Sub-Committee on Ship Design and Construction (SDC) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Reference to 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** |
| 7. Ensure regulatory effectiveness | 7.37 | Consequential work related to the new International Code for Ships Operating in Polar Waters | 2023 | MSC | SSE / NCSR | SDC | Completed | N/A | MSC 93/22, paras.10.44, 10.50 and 20.12; MSC 96/25, para. 3.77; MSC 97/22, paras. 8.32 and 19.25; MSC 101/24, paras. 7.9 and 11.18 and annex 31; MSC.1/Circ.1612; MSC 102/24, para.19.3; SSE 8/20, section 4; MSC 106/19, section 11; MSC.1/Circ.1614/ Rev.1 |
| Note: | After SSE 8 (SSE 8/20, paragraph 4.6) completed its work on the output, there is no outstanding work to be undertaken and, therefore, MSC 107 is invited to delete the output. | | | | | | | | |
| 7. Ensure regulatory effectiveness | 7.38 | Revision of the Performance standards for water level detectors on bulk carriers and single hold cargo ships other than bulk carriers (resolution MSC.188(79)) | ~~2022~~ 2023 | MSC | SSE | SDC | | Completed | MSC 102/24, para.17.23; resolution MSC.188(79)/Rev.1 SDC 7/16, para.7.10; SDC 8/18, section 13 and annex 10 SDC 9/16, section 12 |
| Note: | MSC 105 adopted resolution MSC.188(79)/Rev.1 on Revised performance standards for water level detectors on ships subject to SOLAS regulations II-1/25, II-1/25-1 and XII/12 but requested SDC 9 in 2023 to consider document MSC 105/15/1 (IACS), thus TCY extended to 2023. | | | | | | | | |

| Sub-Committee on Ship Design and Construction (SDC) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Reference to 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** |
| 7. Ensure regulatory effectiveness | 7.42 | Revision of the Interim explanatory notes for the assessment of passenger ship systems' capabilities after a fire or flooding casualty (MSC.1/Circ.1369) and related circulars | 2024 | MSC | SSE/HTW | SDC | | Ongoing | MSC 103/21, para.18.31; MSC 105/20, paras. 15.24.2 and 18.54 SDC 8/18, para. 15.6; SDC 9/16, section 11 |
| Note: | MSC 105 agreed with SDC 8's recommendation for this post-biennial output to be transferred to the current 2022-2023 biennium. | | | | | | | | |

## 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) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **ACCEPTED POST-BIENNIAL OUTPUTS** | | | | **Parent organ(s)** | **Associated organ(s)** | **Coordinating organ** | **Timescale (sessions)** | **Reference** |
| **Number** | **Biennium** | **Reference to strategic direction, if applicable** | **Description** | | | | | |
| 152 | 2016-2017 | 2 | Guidelines for use of fibre-reinforced plastics (FRP) within ship structures | MSC | SDC | | 2 | MSC 98/23, para. 10.22 |
| *Note: It is proposed that output 152 be included in the biennial agenda of the Sub-Committee for 2024-2025 and in the provisional agenda for SDC 10 (see annexes 2 and 3).* | | | | | | | | |
| 190 | 2022-2023 | 2 | Revision of SOLAS chapters II-1 (part C) and V, and related instruments regarding steering and propulsion requirements, to address both traditional and non-traditional propulsion and steering systems | MSC | SDC NCSR | SSE | 2 | MSC 105/20, Paras. 18.23 and 18.24 |
| Tbc | 2022-2023 | | Amendments to the Guidelines for construction, installation, maintenance and inspection/survey of means of embarkation and disembarkation (MSC.1/Circ.1331) concerning the rigging of safety netting on accommodation ladders and gangways | MSC | SSE | SDC | 1 | MSC 106/19, para. 16.28 |
| Note: | It is proposed that this output be included in the biennial agenda of the Sub-Committee for 2024-2025 and in the provisional agenda for SDC 10. | | | | | | | |
| [Tbc] | [2022-2023] | [7] | Safety measures for non-SOLAS ships operating in polar waters | MSC | NCSR | SDC | | SDC 8/18, para.[…] |
| *Note:* SDC 9 decided to put this output on its post-biennial agenda (SDC 9/16, section 3). | | | | | | | | |

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# ANNEX 15

## PROPOSED AGENDA FOR THE 2024-2025 BIENNIUM*

| Reference to SD, if applicable | Output number | Description | Parent organ(s) | Associated organ(s) | Coordinating organ | Target completion year |
|---|---|---|---|---|---|---|
| ~~1. Improve implementation~~ | ~~1.12~~ | ~~Revision of the 1979, 1989 and 2009 MODU Codes and associated MSC circulars to prohibit the use of materials containing asbestos, including control of storage of such materials on board~~ | ~~2023~~ | ~~MSC~~ | ~~SDC~~ | ~~2023~~ |
| 1. Improve implementation | 1.16 | **Review of the 2014 Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life (MEPC.1/Circ.833) (2014 Guidelines) and identification of next steps** | MEPC | SDC | | 2024 |
| 2. Integrate new and advancing technologies in the regulatory framework | 2.3 | Amendments to the IGF Code and development of guidelines for alternative fuels and related technologies | MSC | HTW, PPR, SDC | CCC | Continuous |
| 2. Integrate new and advancing technologies in the regulatory framework | 2.4 | **Further development of the IP Code and associated guidance** | MSC | SDC | | ~~2023~~ 2025 |
| 2. Integrate new and advancing technologies in the regulatory framework | 2.5 | **Safety objectives and functional requirements of the Guidelines on alternative design and arrangements for SOLAS chapters II-1** | MSC | SSE | SDC | 2024 |

* Outputs printed in bold have been selected for the draft provisional agenda for SDC 10, as shown in annex 16. Strikethrough text indicates proposed deletions against the current biennial agenda.

| 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~~ | ~~2.6~~ | ~~Development of Explanatory Notes to the Interim guidelines on second generation intact stability criteria~~ | ~~MSC~~ | ~~SDC~~ | | ~~2022~~ |
| 2. Integrate new and advancing technologies in the regulatory framework | 2.8 | Development of guidelines for cold ironing of ships and consideration of amendments to SOLAS chapters II-1 and II-2 | MSC | III / HTW / SDC | SSE | 2023 |
| Tbc | tbc | **Guidelines for use of fibre-reinforced plastics (FRP) within ship structures** | MSC | SDC | | 2025 |
| Note: Included from the post-biennial agenda (number 152) | | | | | | |
| 2. Integrate new and advancing technologies in the regulatory framework | 2.20 | ~~Development of amendments to SOLAS regulation II-1/3-4 to apply requirements for emergency towing equipment for tankers to other types of ships~~ **[Development of Guidelines for emergency towing arrangements for ships other than tankers]** | MSC | SDC | | ~~2023~~ 2025 |
| Note: | SDC 9 completed the work on the draft amendments to SOLAS regulation II-1/3-4 and proposes that consequential work on the related guidelines be undertaken and proposes to change the output title (SDC 9/16, par. 9.[…]) | | | | | |
| 6. Address the human element | 6.1 | Role of the human element | MSC/ MEPC | III / PPR / CCC / SDC / SSE / NCSR | HTW | Continuous |
| 6. Address the human element | 6.2 | Validated model training courses | MSC/ MEPC | III / PPR / CCC / SDC / SSE / NCSR | HTW | Continuous |
| ~~7. Ensure regulatory effectiveness~~ | ~~6.32~~ | ~~Mandatory application of the Performance standard for protective coatings for void spaces on bulk carriers and oil tankers~~ | ~~MSC~~ | ~~SDC~~ | | ~~Completed~~ |

| Reference to SD, if applicable | Output number | Description | Parent organ(s) | Associated organ(s) | Coordinating organ | Target completion year |
|---|---|---|---|---|---|---|
| ~~7. Ensure regulatory effectiveness~~ | ~~6.33~~ | ~~Performance standard for protective coatings for void spaces on all types of ships~~ | ~~MSC~~ | ~~SDC~~ | | ~~Completed~~ |
| 7. Ensure regulatory effectiveness | 7.1 | **Unified interpretation of provisions of IMO safety, security, environment, facilitation, liability and compensation-related conventions** | MSC / MEPC / FAL / LEG | III / PPR / CCC / SDC / SSE / NCSR | | Continuous |
| 7. Ensure regulatory effectiveness | 7.21 | **Amendments to the 2011 ESP Code** | MSC | SDC | | Continuous |
| 7. Ensure regulatory effectiveness | 7.33 | Review of 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 | 2023 |
| ~~7. Ensure regulatory effectiveness~~ | ~~7.35~~ | ~~Safety measures for non-SOLAS ships operating in polar waters~~ | ~~MSC~~ | ~~NCSR~~ | ~~SDC~~ | ~~2023~~ |
| Note: | Proposed to be moved to the post-biennial agenda | | | | | |
| ~~7. Ensure regulatory effectiveness~~ | ~~7.37~~ | ~~Consequential work related to the new International Code for Ships Operating in Polar Waters~~ | ~~MSC~~ | ~~SSE/NCSR~~ | ~~SDC~~ | ~~2023~~ |
| Note: | SDC 9 invited MSC 107 to delete output 7.37 | | | | | |
| ~~7. Ensure regulatory effectiveness~~ | ~~7.38~~ | ~~Revision of the Performance standards for water level detectors on bulk carriers and single hold cargo ships other than bulk carriers (resolution MSC.188(79))~~ | ~~MSC~~ | ~~SSE~~ | ~~SDC~~ | ~~2023~~ |
| 7. Ensure regulatory effectiveness | 7.42 | **Revision of the Interim explanatory notes for the assessment of passenger ship systems' capabilities after a fire or flooding casualty (MSC.1/Circ.1369) and related circulars** | MSC | SSE/HTW | SDC | 2024 |

| Reference to SD, if applicable | Output number | Description | Parent organ(s) | Associated organ(s) | Coordinating organ | Target completion year |
|---|---|---|---|---|---|---|
| Tbc | tbc | Revision of resolution A.1050(27) to ensure the safety of personnel entering enclosed spaces on board ships | MSC | III, HTW, PPR, SDC and SSE | CCC | 2024 |
| Tbc | tbc | **Amendments to the Guidelines for construction, installation, maintenance and inspection/survey of means of embarkation and disembarkation (MSC.1/Circ.1331) concerning the rigging of safety netting on accommodation ladders and gangways** | MSC | SSE | SDC | 2024 |

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**ANNEX 16**

**PROPOSED PROVISIONAL AGENDA FOR SDC 10**

Opening of the session

1 Adoption of the agenda

2 Decisions of other IMO bodies

[3 Development of Guidelines for emergency towing arrangements for ships other than tankers (2.20)]

4 Further development of the IP Code and associated guidance (2.4)

5 Review of the 2014 Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life (MEPC.1/Circ.833) (2014 Guidelines) and identification of next steps (1.16)

6 Amendments to the 2011 ESP Code (6.22)

7 Safety objectives and functional requirements of the Guidelines on alternative design and arrangements for SOLAS chapter II-1 (2.5)

[8 Amendments to the Guidelines for construction, installation, maintenance and inspection/survey of means of embarkation and disembarkation (MSC.1/Circ.1331) concerning the rigging of safety netting on accommodation ladders and gangways (tbd)]

[9 Guidelines for use of fibre-reinforced plastics (FRP) within ship structures]

10 Unified interpretation of provisions of IMO safety, security, and environment-related conventions (7.1)

11 Revision of the Interim explanatory notes for the assessment of passenger ship systems' capabilities after a fire or flooding casualty (MSC.1/Circ.1369) and related circulars (7.42)

12 Biennial status report and provisional agenda for SDC 11

13 Election of Chair and Vice-Chair for 2025

14 Any other business

15 Report to the Maritime Safety Committee

**ANNEX 17**

**CORRECTION TO THE EXPLANATORY NOTES TO THE INTERIM GUIDELINES ON THE SECOND GENERATION INTACT STABILITY CRITERIA, APPENDIX 2, PARAGRAPH 6.1**

The Explanatory notes to the Interim guidelines on the second generation intact stability criteria, appendix 2, paragraph 6.1, the value of $r_1$, $r_2$, $r_3$, $r_4$, $r_5$ are revised as follows:

| | |
|---|---|
| $r_1$ | -4273.53 [Ns/m] |
| $r_2$ | 7491.11 [$Ns^2/m^2$] |
| $r_3$ | -2668.12 [$Ns^3/m^3$] |
| $r_4$ | 408.20 [$Ns^4/m^4$] |
| $r_5$ | -17.005 [$Ns^5/m^5$] |