**SDC 5 - 22 to 26 January 2018**

*Main outcomes*

The Sub-Committee on Ship Design and Construction (SDC), chaired by Mr. Kevin Hunter (United Kingdom), held its fifth session from 22 to 26 January 2018.

SDC 5 has finalized the draft Guidelines on stability computers and shore-based support for passenger ships constructed before 1 January 2014.

As the draft amendments to SOLAS regulations II-1/1 and II-1/8-1 on computerized stability support for the master in case of flooding for existing passenger ships are deemed to enter into force on 1 January 2020, passenger ships constructed before 1 January 2014 shall comply with SOLAS regulation II-1/8-1.3.1 no later than the first renewal survey after five years after the date of entry into force.

SDC 5 has agreed to a draft resolution on amendments to the 2011 ESP Code to be submitted to MSC 99 for approval, with a view to subsequent adoption at MSC 100 and entry into force on 1 July 2020

SDC 5 also agreed to the draft amendments to SOLAS regulation II-1/3-8 on safe mooring operations, with a view to submission to MSC 101 for approval.

SDC 5 finalized the draft Guidelines for wing-in-ground craft and prepared the associated draft MSC circular for submission to MSC 99.

The following documents will be finalized:

* Draft new Guidelines on the design of mooring arrangements and the selection of appropriate mooring equipment and fittings for safe mooring;
* Draft revised Guidance on shipboard towing and mooring equipment (MSC.1/Circ.1175);
* Draft new Guidelines for inspection and maintenance of mooring equipment including lines.

*Amendments to SOLAS regulation II-1/8-1 on the availability of passenger ships' electrical power supply in cases of flooding from side raking damage*

SDC 4 had re-established the Correspondence Group on Subdivision and Damage Stability (SDS) for the development of draft amendments to SOLAS regulation II-1/8-1 including functional and performance requirements, in order to improve the availability of passenger ships' electrical power supply in cases of flooding from side raking damage.

The work on this output was initiated with a view to improving the availability of passenger ships' electrical power supply in case of an emergency, i.e. ensuring that escape routes and essential services remained available after a flooding incident. It has turned into a discussion on side raking damages and the original purpose of the work might have been lost.

In this context, various delegates have suggested to request the Committee for clarification of the scope of this output and confirmation whether the matter should be solved by applying electrical engineering solutions.

It was decided not to proceed with the finalization of the draft amendments to SOLAS regulation II-1/8-1.2 and to request MSC to clarify what is the exact outcome expected from SDC under this output.

*Computerized stability support for the master in case of flooding for existing passenger ships*

MSC 98 has approved the draft amendments to SOLAS regulations II-1/1 and II-1/8-1 on computerized stability support for the master in case of flooding for existing passenger ships, with a view to adoption at MSC 99, provided that SDC 5 confirmed the application date for the draft SOLAS regulation II-1/8-1.3 and finalized the draft Guidelines on stability computers and shore-based support for passenger ships constructed before 1 January 2014.

SDC 5 has agreed that passenger ships constructed before 1 January 2014 shall comply with SOLAS regulation II-1/8-1.3.1 no later than the first renewal survey after five years after the date of entry into force.

The Ship Damage Stability-SDS Drafting Group has been established and instructed to finalize the draft Guidelines and the associated draft MSC circular.

SDC 5 agreed to the Guidelines and to the associated draft MSC Circular, for submission to MSC 99 for approval.

It also noted the importance of the correct understanding of the date of implementation (i.e. "the first renewal survey after five years after the date of entry into force"). When a ship is fitted with on board computerized stability support before it becomes mandatory, the performance of this computer will be assessed according to these Guidelines and should meet some ground functionality.

*Review SOLAS chapter II-1, parts b-2 to b-4, to ensure consistency with parts B and B-1 with regard to watertight integrity*

When the IMO introduced the probabilistic damage stability standard in SOLAS 2009, a number of amendments to the parts of SOLAS chapter II-1 were made.

However, many of the existing provisions in what are now parts B-2 and B-4 of SOLAS chapter II-1 were not within the scope of the harmonization process leading up to the adoption of the revised SOLAS chapter II-1.

Experience gained when using the SOLAS 2009 standard within recent years demonstrates that some of the requirements regarding watertight integrity in the revised SOLAS chapter II-1 do not capture the change introduced by the probabilistic approach to damage stability.

MSC 96 agreed to include in the 2018-2019 biennial agenda of the Committee an output proposing to review and revise regulations in SOLAS chapter II-1 to ensure consistency between the probabilistic damage stability requirements in parts B and B-1 of SOLAS chapter II-1 and the requirements for watertight integrity contained in parts B-2 to B-4 of SOLAS chapter II-1.

SDC 5 stressed the need, before replacing SOLAS requirements with references to "the International Convention on Load Lines (ICLL) in force", of a harmonization to ensure that these SOLAS requirements are not missed out in ICLL.

It is worth mentioning that the term "watertight deck" used in the proposed solution for paragraph 7 of SOLAS regulation II-1/22 is not defined in the current SOLAS regulations and, therefore, the definition of this term is needed.

SDC 5 noted also the proposed solutions for SOLAS regulations II-1/13 and II-1/13-1 contradict the requirement for valves on piping penetrating collision bulkhead, i.e. SOLAS regulation II-1/12.6.1, which does not accept the valves of cast iron.

Cast iron is not allowed for the valve at collision bulkhead for the reason that these valves shall be located inside the forepeak tank, namely in the front of collision bulkhead, as required in SOLAS regulation II-1/12.6.1, and would be exposed to high risk of damage in case of collision.

In order to progress the work on this output, SDC 5 re-established the CG on SDS.

*Finalization of second generation intact stability criteria*

The discussions on developing intact stability criteria for dynamic intact stability issues are pending for many years.

Member States and international organizations were invited to submit to SDC 5 proposals regarding the application of operational limitations and/or operational guidance within the framework for the second generation intact stability criteria.

Five intact stability failure modes have been identified:

* Parametric rolling;
* Dead ship conditions;
* Surf riding/broaching;
* Excessive accelerations;
* Pure loss of stability on a wave crest.

The goal to be achieved is to have some consistent criteria against which ships can be tested to identify whether they are susceptible to any of the above intact stability failure mode. A pass at the simplest level (level 1) will mean that there is no need to progress to the more complex calculation at level 2.

The Sub-Committee has already spent more than 10 years for this development. So far no real output was presented, even if the draft text of vulnerability criteria and standards for five failure modes have already been developed as well as the draft Guidelines for direct stability assessment.

For the vulnerability criteria, several undecided elements relating to inconsistencies between levels 1 and 2 exist.

The Chair invited SDC 5 to consider whether the levels 1 and 2 vulnerability criteria and the direct stability assessment could be finalized as a package at SDC 6, provided that direct stability assessment should be feasible with effective guidelines for practical stakeholders, or the MSC should be advised that the SDC is unable to complete this output.

SDC 5 agreed that IS Correspondence Group should be re-established.

Its Terms of Reference (ToR) are as follows, for completion at SDC 7 with interim report at SDC6:

* Finalize, in their essential aspects, the Interim Guidelines for the specification of direct stability assessment;
* Prepare, in their essential aspects, the Interim Guidelines for the preparation of operational limitations and operational guidance;
* Finalize the draft vulnerability criteria (levels 1 and 2) for each of the five stability failure modes.

*Mandatory instrument and/or provisions addressing safety standards for the carriage of more than 12 industrial personnel (IP) on board vessels engaged on international voyages*

The IP Correspondence Group was instructed to:

* Develop a matrix that identifies the relevant aspects of the existing IMO regulatory framework, with regard to definitions and application, in order to ensure that the new SOLAS chapter XV dedicated to industrial personnel and the new code are consistent with;
* Develop the draft new SOLAS chapter XV;
* Develop the draft new code.

The Plenary endorsed the proposal to use the matrix drafted by IACS listing the various mandatory and non-mandatory IMO instruments and their applications as a "checklist", when developing the draft new SOLAS chapter XV and the draft IP Code.

The Plenary agreed that non-mandatory instruments should not be referenced in the aforementioned instruments, the relevant parts of the text should be reproduced instead. With regard to training criteria for industrial personnel, the STCW convention should not be referenced in the draft new code, relevant parts of the text should be reproduced in the code.

SDC 5 established the Working Group on Carriage of more than 12 IP, and asked it to further develop the draft new SOLAS chapter XV and the draft new code.

The WG agreed on the following principles to be taken into account during the development of the aforementioned instruments:

* The draft new code applies to cargo ships of 500 GT and above;
* The definition of the term "international voyage" (SOLAS regulation I/2(d)) should not be modified;
* The opportunity of an application of the draft new code to ships under 500 GT carrying more than 12 industrial personnel and to ships not engaged on international voyages on a voluntary basis should be considered either in the resolution adopting the IP Code or in a separate resolution.

The Chair requested the delegates to bring the following questions, addressed during the WG, to MSC through dedicated submissions:

* Requirements based upon the total number of persons on board without specifying those persons, which would allow for the carriage of special personnel without the need for future amendments to the code;
* Limitation of aggregate number of other persons; a matrix has been developed by the CG and could be used to support the work towards a common understanding regarding the number of persons that may be carried on board and the relationship of the draft new code with other IMO instruments;
* Giving the current definition of “international voyages” , a proposal to capture ships operating between offshore structures and port;
* Need of including ships less than 500 GT;
* Need of including special personnel on the number of IP.

The Group agreed to the title "Safety measures for ships carrying industrial personnel" for the new chapter XV.

In order to allow the carriage of industrial personnel on ships regardless of size, it has been agreed that new SOLAS chapter XV should not be restricted to cargo ships of 500 GT.

From a SOLAS perspective, all ships regardless of the date of construction, should meet the provisions of the IP Code, if intending to carry more than 12 industrial personnel on international voyages.

Notwithstanding the above, the CG agreed that some kind of grandfathering should be considered at a later stage of the development of the IP Code and associated SOLAS amendments.

The draft new code should have a goal and functional requirements for each chapter.

A separate certificate for compliance with the draft new code will be issued, in addition to the Safety Certificate for Cargo Ships.

Structural arrangements, machinery and electrical installation, fire safety design and arrangement measures and as well as life-saving appliances and arrangements may deviate from the prescriptive requirements of the IP Code, provided that the alternative design and arrangements meet the intent of the goal and functional requirements concerned and provide an equivalent level of safety to the requirements.

SDC 5 re-established a GG on IP to further develop the draft new SOLAS chapter XV and the draft new code.

*Amendments to the 2011 ESP code*

SDC 4 requested the IMO Secretariat and IACS to analyze the existing text of the 2011 ESP Code, to propose editorial changes, to improve the format of the tables and forms, for consideration at SDC 5, and, then, to prepare a draft consolidated text of the ESP Code for consideration at SDC 6.

In this context, before preparing a draft consolidated text of the ESP Code, the Secretariat asked SDC 5 for confirmation that all substantive provisions, rather than references, currently contained in the 2011 ESP Code should be included in the main body of the new consolidated Code.

The Plenary also agreed to the following roadmap:

* Preparation by Secretariat and IACS of a draft MSC resolution on amendments to the 2011 ESP Code to be submitted to MSC 99 for approval, with a view to subsequent adoption at MSC 100 and entry into force on 1 July 2020;
* Development in parallel of the consolidated version of the ESP Code, based on the draft amendments to be approved by MSC 99, with a view to preparing a draft Assembly resolution adopting the consolidated version of the ESP Code and revoking resolutions A.744(18) and A.1049(27), for consideration and finalization at SDC 6.

Following discussion in Plenary, the Working Group on Amendments to the 2011 ESP Code was established to consider the new substantial amendments to the 2011 ESP Code, proposed by IACS in order to deal with the recent updates to the IACS UR Z10 series, and to prepare a draft MSC resolution on adoption of amendments to the 2011 ESP Code.

As proposed by IACS, SDC 5 agreed to the use of the term "firm" rather than "company", in the view, for instance, to differentiate a thickness measurement company and the shipowner company as defined by the ISM Code.

SDC 5 recalled that regulations II-1/3-2 and II-1/3-11 require the provision of a coating technical file and that mandatory resolutions MSC.215(82) and MSC.288(87) require it to be maintained during the life of the ship.

SDC 5 agreed to replace the term from "classification society" by "recognized organization", in line with the text in annex B parts A and B and IMO standard terminology.

The draft MSC resolution on Amendments to the 2011 ESP Code is to be submitted to MSC 99 for approval and subsequent adoption.

*Unified interpretation to provisions of IMO safety, security, and environment-related conventions*

Clarification on the safe return to port requirement for the liquid level monitoring systems. IACS considers that there are two different understandings on the issue as to whether the liquid level monitoring systems for tanks containing liquids, which are not installed with a flooding detection system, need to meet the safe return to port requirement in SOLAS regulation II-2/21.4.13.

One understanding is that the liquid level monitoring system does not need to meet the safe return to port requirements in SOLAS, owing to the fact the main purpose of the flooding detection system is to detect the presence of any liquid in spaces that are supposed to be dry at all times, and not to be a secondary system for continuously monitoring/indicating the level of tanks that normally contain liquids.

The other understanding is that SOLAS regulation II-2/21.4.13 requires flooding detection systems to remain operational when fire damage does not exceed the casualty threshold specified in SOLAS regulation II-2/21.3.

SDC 5 agreed that liquid level monitoring systems should meet the safe return to port requirement and invited IACS to develop a unified interpretation, taking into account that there should be no retroactive application of the agreed understanding.

Means of escape from control stations, accommodation and service spaces in case of flooding. Doors in escape routes from control stations, accommodation and service spaces are generally required to open in the direction of escape, except that doors in vertical escape trunks may open out to permit the trunk to be used for access.

The relevant provisions of SOLAS regulation II-2/13 states:

"3.1.5 Doors in escape routes shall, in general, open in-way of the direction of escape, except that (…) doors in vertical emergency escape trunks may open out of the trunk in order to permit the trunk to be used both for escape and for access."

CLIA has submitted to SDC 5 a draft unified interpretation of SOLAS regulation II-2/13.3.1.5.2, providing the view that doors in vertical emergency escape trunks may open out of the trunk in order to permit the trunk to be used both for escape and for access, provided that such doors are not located below the bulkhead deck.

SDC 5 noted that SOLAS regulation II-2/13.3 applies to control stations, accommodation and service spaces, but not to machinery spaces and, therefore. It considered that the proposal should be considered as an amendment to SOLAS regulation II-2/13.3.1.5.2.

*Revised SOLAS regulation II-1/3-8 and associated guidelines (MSC.1/CIRC.1175) and new guidelines for safe mooring operations for all ships*

The Correspondence Group on Safe Mooring Operations established at SDC 4 was instructed to:

* Further consider the draft revised SOLAS regulation II-1/3-8, regarding the design of arrangements and selection of equipment for safe mooring;
* Further consider the draft new Guidelines for safe mooring operations on all ships, supporting the draft revised SOLAS regulation II-1/3-8, regarding the design of arrangements and selection of equipment for safe mooring;
* Review MSC.1/Circ.1175 and the draft new Guidelines in light of recent updates to IACS Unified Requirement (UR) A2, and IACS Recommendation 10;
* Develop separate guidelines on safe mooring operations, taking into account the need for any additional guidance on selection, identification, inspection, maintenance and use of mooring lines.

SDC 5 agreed to the draft amendments to SOLAS regulation II-1/3-8, with a view to submission to MSC 101 for approval. The draft amendments will be forwarded to MSC once the various Guidelines have been finalized.

SDC5 to include a reference to mooring lines in the draft revised SOLAS regulation II-1/3-8. It was considered that there is a need to recognize mooring lines as an integral part of the mooring system on board in the draft SOLAS regulation II-1/3-8 to ensure that the design of mooring arrangements, equipment and fittings takes into account the strength, material and diameter of the mooring lines, which are expected to be used during the normal operation of the ship.

The term "including lines" should be directly reflected in the draft revised SOLAS regulation II-1/3-8 and should apply to new ships only.

Considering that the related draft new guidelines are focusing on the design of the mooring arrangements and the selection of appropriate mooring equipment, which provide protection to related personnel, it has been decided to introduce the term "applying a human-centered design approach".

SDC 5 agreed that ships of less than 3,000 GT should, in a non-mandatory way, comply with either the requirements for ships of 3,000 GT and above as far as reasonably practicable, or with applicable national standards of the Administration which provide an equivalent level of safety.

It was agreed to include a new paragraph 9 in the draft revised SOLAS regulation II-1/3-8 with regard to inspection and maintenance of mooring equipment for all ships including existing ships regardless of date of construction. This inspection and maintenance does not refer to the annual survey required by chapter I of the SOLAS Convention, which should be clearly reflected in the guidelines.

The scope of the draft new guidelines is limited to the design of mooring arrangements and the selection of mooring equipment. In this context, the title of the guidelines has been modified as *Guidelines on the design of safe mooring arrangements and the selection of appropriate mooring equipment and fittings for safe mooring*.

Exceptional mooring and towing operations should not be reflected in the draft Guidelines.

For aligning the draft Guidelines with the draft revised SOLAS regulation II-1/3-8, the words "a human-centered design approach" have been incorporated and defined.

"Human-centred design means an approach to interactive systems development that aims to make systems usable and useful by focusing on the users, their needs and requirements, and by applying human factors/ergonomics, and usability, knowledge and techniques.”

New definition for mooring lines has been also added: *“Mooring lines means both ropes, wires and combinations used for mooring operations and may include tails.”*

Draft revised guidance on shipboard towing and mooring equipment - (MSC.1/Circ.1175). It was agreed in particular:

* The appropriate marking of fittings used for both mooring and towing purposes is to indicate both the Safe working load (SWL) and the Safe towing load (TOW);
* The requirement for towing and mooring arrangements plans should be included in this revised Guidance and content of the towing and mooring arrangements plans and their content should be updated in accordance with the latest IACS UR.

SDC 5 agreed to a new title: "Guidelines for inspection and maintenance of mooring equipment including lines".

In order to clarify that the inspection is not an annual survey required by chapter I of the SOLAS Convention, it has been agreed to use the term "in-service inspection".

SDC 5 re-established a Correspondence Group and instructed it to:

- Further develop the draft new Guidelines on the design of mooring arrangements and the selection of appropriate mooring equipment and fittings for safe mooring;

- Further develop the draft revised Guidance on shipboard towing and mooring equipment (MSC.1/Circ.1175);

- Further develop Guidelines for inspection and maintenance of mooring equipment including lines.

*Guidelines for wing-in-ground craft*

MSC 96 decided to maintain the output on Guidelines for wing-in-ground craft in its post-biennial agenda, for inclusion in the provisional agenda for SDC 5, with a view to finalization during the 2018-2019 biennium.

SDC 5 had for its consideration the outcome of the revision of the Interim guidelines for wing-in-ground craft (MSC/Circ.1054 and Corr.1), carried out intersessionally.

* The draft Guidelines should apply to WIG craft carrying more than 12 passengers and/or having a full load displacement of more than 10 tons;
* Safety standards for small WIG craft should not be included in the draft Guidelines, at least at this stage;
* Standards developed by the European Aviation Safety Agency, i.e. Certification Specifications (CS) 23, should not be referred in the draft Guidelines;
* The draft Guidelines should specifically clarify that WIG craft, when not waterborne, should take all responsibility to avoid collision.

The Drafting Group finalized the draft Guidelines and prepared the associated draft MSC circular for submission to MSC 99, for approval.

*Biennial status report*

MSC 98 decided to introduce in its agenda for the 2018-2019 biennium the following new outputs:

* Safety measures for non-SOLAS ships operating in polar waters (i.e. application of the Mandatory Code to non-SOLAS ships operating in polar waters);
* Development of guidelines for cold ironing of ships and of amendments to SOLAS chapters II-1 and II-2, if necessary.

*Any other business*

SDC 5 had for its consideration a question on the fire integrity requirements for the steering gear compartment of ships carrying not more than 36 passengers and cargo ships, and a proposal from China to amend regulation II-2/3.30 by adding “steering gears” in the list of Machinery spaces.

Recalling that in MSC/Circ.1120 on Unified Interpretations of SOLAS chapter II-2, the FSS Code, the FTP Code and related fire test procedures, steering gear rooms are within category 7;SDC 5 suggested to evocate this issue at SSE.

The issue on consistency of in-water survey (IWS) provisions for passenger and cargo ships, related to discrepancies between the Survey Guidelines under the Harmonized System of Survey and Certification (HSSC), 2015 (resolution A.1104(29)) and the Guidelines for the assessment of technical provisions for the performance of an in-water survey in lieu of bottom inspection in dry-dock to permit one dry-dock examination in any five-year period for passenger ships other than ro-ro passenger ships (MSC.1/Circ.1348), has also been forwarded to SSE.