INTERNATIONAL MARITIME ORGANIZATION

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

Comments on document SDC 2/10

Submitted by INTERTANKO

SUMMARY

Executive summary:	This document provides comments on document SDC 2/10
Strategic direction:	5.2
High-level action:	5.2.1
Planned output:	5.2.1.26
Action to be taken:	Paragraph 15
Related documents:	SDC 2/10 and SDC 2/INF.2

1 This document is submitted in accordance with paragraph 6.12.5 of the *Guidelines on 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.4/Rev.3) and comments on the report from the Correspondence Group on Amendments to SOLAS regulation II-1/11 and development of associated guidelines to ensure the adequacy of testing arrangements for watertight compartments (SDC 2/10).

2 Paragraph 23.2 of document SDC 2/10 invites the Sub-Committee to "concur with the view that amendments to SOLAS regulation II-1/11 are necessary for alternative tests". INTERTANKO strongly disagrees with this recommendation. The main reason is that this is the only SOLAS regulation that mandates a full scale test to ensure the watertightness of tanks intended to carry liquids on ships. It is an excellent check to ensure that oil and chemical cargoes do not migrate from cargo spaces in adjacent void/ballast spaces. It is the only full scale test opportunity to check the roboustness of the double hull structure of oil and chemical tankers. The proposed alternative amendments presented in paragrphs 9, 10 and 11 of document SDC 2/10 will weaken the level of ensuring watertightness of tanks intended to carry liquids on ships.

3 INTERTANKO also disagrees with the elements given as technical background in favour of amending SOLAS regulation II-1/11. These elements (included in document MSC 86/23/13 and addressed by the correspondence group in paragraph 3) are listed below with INTERTANKO comments.

Technical background

4 Adequacy of design of tanks of structural similarity or tanks of series built ships in the same shipyard can be accurately evaluated by modern design tools (FEM, etc.), such as classification rule requirements on strength analysis, and confirmed by carrying out hydrostatic testing of a representative tank of a group of tanks having structural similarity and tanks of subsequent ships of the series built at the same yard (SDC 2/10, paragraph 3.1) – INTERTANKO does not agree with this argument. It implies that class rules and modern design tools guarantee that all ships, including first ship in series are well executed. Based on experience of the INTERTANKO members, Class new building rules still leave little margin within which strength can deteriorate due to the cumulative effect of undetected errors. Rigorous testing therefore must remain a solid verification of the soundness of the vessel and should not be treated lightly, even though sometime they are time and resources consuming. Such argument also gives no due regard to possible manufacturing errors. Local design changes on ships have been the cause of buckling events on new buildings when using water for testing. Below is a list of non-conformities (but not limited to) experienced and reported by our members at various shipyards:

.1 tests with alternative methods (air test in deep penetration welds, vacuum tests, NDT's) concluded leak free but hydrostatic strength test resulted in leaks between transverse cargo bulkheads and between cargo and ballast longitudinal bulkheads;

.2 buckling during strength test – poor quality of the bottom cargo tank construction and carling support;

.3 oversight in including of drawing approval comments;

.4 design missing remedial requirements from problems of previous sister ships (increased thicknesses, dimensions, additional brackets etc.); remedial missing into the production drawings and finally not performed to the ship;

.5 failures of the ship in series from minor detail: stringer lightening hole moved a few feet on the 4th vessel in series resulted in buckling problem during tank testing;

.6 welding during rainy, humid and snowy weather;

.7 welding HTS with cold electrodes in cold or freezing weather;

.8 welding in double bottoms that had just been drained from salt water ballast used for temporary floating and shifting of hull during launching of the vessels in front;

.9 NDT testing and x-rays; expensive and harmful – limited number of tests; and

.10 tankers experienced leaks when performed alternate and cross loading.

The above have also been experienced in a wide variety of shipyards because the shipyards procedures are not always followed. INTERTANKO is therefore concerned that many of these elements based on actual findings are not addressed at design stage nor are they captured by the simple existence of a certified quality standard.

5 The quality of structural fabrication can be assured by the surveyor through examinations of the structural details during construction of ships (SDC 2/10, paragraph 3.2) – INTERTANKO disagrees. It is not a technical but a factual argument. Unfortunately and regrettably, shipowners keep inspection teams at the building site as the quality of the structural fabrication can only be assured through "inspection". Class activity is limited to "surveying" which is not sufficient.

6 Hydrotesting was justified by riveted ships but not needed for welded ships (SDC 2/10, paragraph 3.2) – this is a poor argument which carries little technical weight. Ships have been welded since 1960s. During all these 50 years, there have been numerous incidents expereinced with both leaks and buckling during hydrotesting. Poor design and changes to local design have been major factors of bucklings. Leaks are mainly due to poor welding execution, particularly during cold seasons and during rainy sesons. The number and locations for NDT checks on a new building are limitted in number for obvious reasons. Even if these would be increased, they would still cover a fraction of the thousands of kilometers of welds on a ship. Hydrotesting is the most efficient and trustworhty check for watertightness and structural robustness.

7 Hydro testing is only a test to static pressure, it does not cover dynamic stresses ships experience at sea, therefore one could renounce to it (SDC 2/10, paragraph 3.3) – INTERTANKO cannot agree with the argument that, because it is not possible to simulate the dynamic stresses at ship's full scale, one should give up in using the best alternative for full scale test for static stresses. Hydrotesting should remain a minimum "must to do" requirement. In the IACS CSR for oil tankers and bulk carriers, the Overall Stress is comprised by the sum of three components: Local (hydrostatic), Global (hogging, sagging, etc.) and Dynamic (riding waves, bow slamming etc.). The first two can be full scale tested while the ship is in the yard or anchorage by hydrostatic testing. The dynamic part can regrettably only be estimated by calculations. If any improvement is needed, one could have suggested to augment the condition of full scale hydrotesting of the structural integrity of ships instead of minimizing and diluting it. It makes a lot of sense to keep testing for leakages, local stresses and global stress together. Tests could be done simultaneously, e.g. ballasting alternate (checkerboard) tanks to inspect the bulkheads (Local), then adding water to the empty tanks to simulate the loading which shows the maximum bending moments or shear forces, as given in the ship's Loading Manual (Global); then, discharging the water from cargo tanks into the ballast tanks to check the worst ballast tank combination from the ship's manual (Global). This approach would bring more confidence in the quality of the hull structure as tanks will be simultaneously subjected to the aggregate of local and global stresses.

Aditional arguments and advantages for using hydrostatic testing

8 INTERTANKO believes that hydrostatic testing should be considered in all watertight compartments located below the full scantling waterline, including void spaces, as they are relevant to tightness against flooding and survivability in case of hull damage. Some void spaces are very crucial to be water and hermetically tight spaces, used to separate explosive cargo tanks from intrinsically safe areas such as engine rooms, etc. This aspect needs to be considered within the condition of a structure which is under severe stress. Compliance needs to be proven with the best applicable means at the time of the ship's delivery.

INTERTANKO position on the proposed amendment to SOLAS regulation II-1/11

9 INTERTANKO is of the opinion that the technical background provided in paragraph 3 of document SDC 2/10 does not provide sufficient justification to warrant an amendment to SOLAS regulation II-1/11 as suggested. INTERTANKO believes the proposed amendment will dilute the condition for testing at full scale.

Unified Interpretation/IACS UR S14

10 As part of the possible developments on the testing and alternative means to hydrotesting, one option was to review IACS UR S14, as proposed in annex 7 of document SDC 2/INF.2

11 INTERTANKO does not opt out the possibility that flag Administrations consider to approve in certain conditions use of alternative methods to hydrostatic testing. However, as far as tankers are concerned, INTERTANKO would suggest that flag Administrations may consider flexibility based on a Unified interpretation as presented in annex 7 of document SDC 2/INF.2. For tankers, hydrostatic testing should be performed at least on "all cargo tank boundaries with adjacent compartments have to be tested by hydraulic testing irrespective which side of the compartment is filled".

12 It is suggested in annex 7 of document SDC 2/INF.2 that alternatives to hydrostatic testing should be applicable to sister ships. The logic is shipyards gain experience and might have corrected some non-conformities. However, experience indicates that corrective actions might not always be carried over to subsequent ships. One such ship might be built for a new owner, under a new class society and registered into a new flag Administration as any of the precedent sister ships have been related to. Although the ship yard is supposed to keep records and report on any non-conformities and improvements, a full insight on documentation of previous ships is not possible due to contractual clauses. INTERTANKO would argue that in such a case, a ship in a series should also be considered as the "first" when built for a new owner, under a new class society and a new flag Administration.

Quality Control of Standards (Quality Management Systems or QMS)

13 Shipyard QMS procedures is a tool for builders to meet contractual and regulatory requirements and to be assured that the ship will meet requirements and pass the necessary tests. INTERTANKO concerns are that to date, QMS requirements have proved to be of little use with some shipyards. RO verification of procedures has proven also not be a guarantee such QMS are followed which results that in quite a number of shipyards quality check is done by owner's staff.

Conclusions

14 With regard to the proposed amendment to SOLAS regulation II/1-11, INTERTANKO members are extremely concerned with the impact a SOLAS amendment may have on their ability to seek hydrostatic testing to a decent extent. Such tests are extremely valuable to shipowners and to the safety and the environmental performance of tankers. The key element is the UR S14 of IACS, as redrafted in annex 7 of document SDC 2/INF.2. Therefore, INTERTANKO would suggest that:

.1 SOLAS regulations II-1/11.2 and II-1/11.3 remains applicable and there is no need for amending them;

.2 Flag Administrations may provide use of alternatives as presented on an Unified interpretation based on the draft contained in annex 7 of SDC 2/INF.2; and

.3 Allowance for alternatives should ensure that tankers still have sufficient tanks subject to hydrotesting so that the double hull requirements would be tight and robust.

Action requested of the Sub-Committee

15 The Sub-Committee is invited to consider the above proposals and decide as appropriate.