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DEVELOPMENT OF DESIGN AND PROTOTYPE TEST REQUIREMENTS FOR THE ARRANGEMENTS USED IN THE OPERATIONAL TESTING OF FREE-FALL LIFEBOAT RELEASE SYSTEMS WITHOUT LAUNCHING THE LIFEBOAT

Draft amendments to paragraph 4.7.6.4 of the LSA Code and resolution MSC.81(70)

Submitted by Marshall Islands, IACS, INTERTANKO and IPTA

SUMMARY

Executive summary:	This document proposes amendments to paragraph 4.7.6.4 of the LSA Code; consequential draft amendments to paragraphs 6.9.7 (Part 1) and 6.1.1 (Part 2) of resolution MSC.81(70) to address the design and prototype test requirements for the equipment used in the simulated launching of free-fall lifeboats; and consequential amendments to MSC.1/Circ.1529 to expand its application to paragraph 4.7.6.4 of the LSA Code.
Strategic direction, if applicable:	7
Output:	7.33
Action to be taken:	Paragraph 22
Related documents:	SSE 3/4, SSE 3/16 (paragraphs 4.5 and 4.14); MSC 97/19/4; SSE 4/19 (paragraphs 4.5 to 4.10) and MSC 101/21/10

Introduction

1 At its 101st session, the Maritime Safety Committee agreed to include in its post-biennial agenda an output on "Development of design and prototype test requirements for the arrangements used in the operational testing of free-fall lifeboat release systems without launching the lifeboat", i.e. the equipment used in the simulated launching of free-fall lifeboats, with two sessions needed to complete the item, assigning the SSE Sub-Committee as the associated organ.

2 The Committee further agreed that:

.1 the amendments to be developed should apply to all ships for which SOLAS chapter III required the carriage of free-fall lifeboats;

.2 the instrument to be amended was the LSA Code, paragraph 4.7.6.4; and

.3 the amendments to be developed should enter into force on 1 January 2024, provided that they were adopted before 1 July 2022.

3 Further, MSC 107 approved the provisional biennial agenda for the SSE Sub-Committee for the 2024-2025 biennium, which included the output as an agenda item of SSE 10.

Background

4 The Australian Transport Safety Bureau (ATSB), in their report entitled "Unintentional release of the freefall lifeboat from Aquarosa", recommended that the simulation equipment (e.g. wires) used for maintenance and testing should be approved and designed to take into account the shock loading that would be experienced during a simulated launching, as well as the static weight of the lifeboat. This issue was originally discussed in document SSE 3/4 (IACS). Further discussion of this particular issue related to the operational simulated launching of free-fall lifeboats was, in effect, placed in abeyance pending the finalization of the provisions relating to the conduct of drills in relation to such a survival craft, as now addressed in the *Guidelines on safety during abandon ship drills using lifeboats* (MSC.1/Circ.1578).

5 However, while MSC.1/Circ.1578 appropriately addresses the risks associated with conducting drills on free-fall lifeboats, there is a demonstrable need to develop design and prototype test requirements for the arrangements used in the operational testing of free-fall lifeboat release systems without launching the lifeboat (the equipment used in the simulated launching of free-fall lifeboats).

Discussion

6 The conduct of the operational testing of free-fall lifeboat release systems (SOLAS regulation III/20.11.2.3) is addressed in paragraph 6.2.7 of resolution MSC.402(96) on *Requirements for maintenance, thorough examination, operational testing, overhaul and repair of lifeboats and rescue boats, launching appliances and release gear*, which states:

6.2.7 The operational test of the free-fall lifeboat release function shall be carried out as follows:

.1 engage the arrangements for the test without launching the lifeboat, required by paragraph 4.7.6.4 of the LSA Code, as specified in the manufacturer's operating instructions;

.2 if required to be on board, ensure that the operator is properly seated and secured in the seat location from which the release mechanism is to be operated;

.3 operate the release mechanism to release the lifeboat;

.4 reset the lifeboat in the stowed configuration;

.5 repeat the procedures referred to in .2 to .4 above, using the back-up release mechanism, if applicable;

.6 remove the arrangements for the test without launching the lifeboat, required by paragraph 4.7.6.4 of the LSA Code; and

.7 verify that the lifeboat is in the ready to launch stowed configuration.

7 The functional requirement that the design of the free-fall lifeboat release system is such that it can be tested without launching the lifeboat is prescribed in paragraph 4.7.6.4 of the LSA Code, i.e.:

> 4.7.6 Lifeboat fittings
>
> Each free-fall lifeboat shall be fitted with a release system which shall:
>
> …
>
> .4 be designed to test the release system without launching the lifeboat; and

8 While paragraph 6.2.7.1 of resolution MSC.402(96) prescribes the use of "the arrangements" required by paragraph 4.7.6.4 of the LSA Code, it is noted that the requirements of paragraph 4.7.6.4 of the LSA Code do not address "the arrangements" as such, but instead only specify a functional requirement that a release system of the free-fall lifeboat can be tested without launching the lifeboat.

9 The co-sponsors are of the view that there is a need to amend paragraph 4.7.6.4 of the LSA Code to include requirements for the design of "the arrangements" taking into account the static weight of the lifeboat, as well as the shock loading that would be experienced in the operational testing of the free-fall lifeboat release system without launching the lifeboat (a simulated launch).

Static loads

10 In this regard, paragraph 6.1.1.5 of the LSA Code already provides the basis for the static loads applicable to the simulated launching equipment, as shown below. Therefore, the co-sponsors consider that no separate requirement needs to be established under the LSA Code to address the static load test of the simulated launching equipment.

> "The launching appliance and its attachments other than winches shall be of sufficient strength to withstand a factory static proof load test of not less than 2.2 times the maximum working load."

Dynamic loads

11 For the dynamic loads, various requirements under chapters 4 and 6 of the LSA Code, such as paragraph 4.4.7.6.14 (the release mechanisms of davit-launched lifeboats), paragraph 6.1.1.6 (falls, suspension, links and block of launching appliance), etc., use the safety factor 6 based on the ultimate strength of material and the static mass exposed to the component, i.e. maximum working load.

12 It is understood that the slide of the free-fall lifeboat on the skid is normally not more than a few centimetres. In these circumstances, the induced kinetic energy is not expected to be high and the co-sponsors consider that the safety factor of 6 (based on the maximum working load and the ultimate strength of material used) may sufficiently cover the dynamic loads to which the simulated launching equipment is exposed.

13 However, considering that the design and arrangement of simulated launching equipment may differ among manufacturers, the co-sponsors believe that the need for requirements to address potential excessive dynamic loads should be considered. The intention would be to account for the theoretical circumstances where the simulated launching equipment design would allow for a longer and faster test slide on the skid.

14 In addition, it is considered that "the arrangement" needs to be corrosion-resistant to maintain its strength in the exposed marine environment that may bear the verified dynamic and static loads.

Consequential draft amendments to resolution MSC.81(70)

15 The co-sponsors believe that the prototype test requirements for "the arrangements", as detailed by paragraph 4.7.6.4 of the LSA Code, should be reflected in the *Revised recommendation on testing of life-saving appliances* (resolution MSC.81(70)). Accordingly, a small consequential amendment to resolution MSC.81(70) to include the simulation equipment in the prototype test requirements is proposed.

16 Table 1 in the annex visualizes the link between the design requirements in the LSA Code and the prototype test provisions in resolution MSC.81(70) for the dynamic and static loads on the release systems, including the draft amendments suggested in paragraphs 20 and 21 below.

Consequential draft amendments to MSC.1/Circ.1529

17 Hooks for conventional lifeboats, i.e. except free-fall lifeboats, are addressed by paragraph 4.4.7.6.9 of the LSA Code requiring the material to be corrosion-resistant in the marine environment without the need for coatings or galvanizing. The *Unified interpretations of paragraph 4.4.7.6 of the LSA Code, as amended by resolution MSC.320(89)* (MSC.1/Circ.1529) provides guidance on the application of paragraph 4.4.7.6.9 of the LSA Code.

18 Release systems for free-fall lifeboats are addressed by a different requirement of the LSA Code, i.e. paragraph 4.7.6. Therefore, the guidance provided in MSC.1/Circ.1529 would not be applicable to an amended paragraph 4.7.6.4 of the LSA Code.

19 Accordingly, subject to consideration of the proposal in paragraph 20 below, the co-sponsors suggest that the Sub-Committee consider consequential amendments to MSC.1/Circ.1529 to expand its application to paragraph 4.7.6.4 of the LSA Code as follows:[*]

UNIFIED INTERPRETATIONS OF PARAGRAPHS 4.4.7.6 AND 4.7.6.4 OF THE LSA CODE, AS AMENDED BY RESOLUTION MSC.320(89)

…

ANNEX

UNIFIED INTERPRETATIONS OF PARAGRAPHS 4.4.7.6 AND 4.7.6.4 OF THE LSA CODE, AS AMENDED BY RESOLUTION MSC.320(89)

…

[*] Here and throughout the document, tracked changes are indicated using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.

Paragraphs 4.4.7.6.9 and 4.7.6.4

Proposals

20 Based on the discussion above, it is proposed to amend paragraph 4.7.6.4 of the LSA Code to read:

> .4 be designed to test the release system without launching the lifeboat, using a simulation arrangement that shall:
>
> .1 be designed with a safety factor of at least [6] on the basis of the maximum working load assigned and the ultimate strength of the materials used for its construction;
>
> .2 have all components constructed from material that is corrosion resistant in the marine environment without the need for coatings or galvanizing; and

21 In addition, it is proposed that the *Revised recommendation on testing of life-saving appliances* (resolution MSC.81(70)) should be amended as follows:

> **Part 1 – Prototype test for life-saving appliances**
> **6.9 Release mechanism test**
>
> 6.9.7 The release mechanism, including the simulation equipment, should be mounted on a tensile strength testing device. The load should be increased to at least six times the working load of the release mechanism without failure of the release mechanism.
>
> **Part 2 – Production and Installation Tests**
> **6.1 Launching appliances using falls and winches**
>
> 6.1.1 Each launching appliance, except the winch, should be tested with a static load of 2.2 times the working load with the appliance in the full outboard position. For a free-fall lifeboat launching appliance, each launching ramp and its connection to the release mechanism, including the simulation equipment, should be tested with a static load of 2.2 times the working load. The appliance should not be deformed or damaged. Winches with the brakes applied should be tested by applying a static load of 1.5 times the maximum working load. Any cast components of the frame and arm should be hammer-tested to determine that they are sound and without flaw.

Action requested of the Sub-Committee

22 The Sub-Committee is invited to note the information, including the annex, and to consider:

> .1 the proposals in paragraphs 20 and 21;
>
> .2 consequential amendments to MSC.1/Circ.1529 to expand its application to paragraph 4.7.6.4 of the LSA Code as proposed in paragraph 19; and
>
> .3 take action, as appropriate.

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ANNEX

SUMMARY OF DESIGN AND PROTOTYPE TEST REQUIREMENTS FOR THE EQUIPMENT USED IN THE SIMULATED LAUNCHING OF FREE-FALL LIFEBOATS, INCLUDING DRAFT AMENDMENTS

	LSA Code	Resolution MSC.81(70)
Dynamic load	Paragraph 4.7.6.4: …be designed to test the release system without launching the lifeboat, using a simulation arrangement that shall: .1 be designed with a safety factor of at least [6] on the basis of the maximum working load assigned and ultimate strength of the materials used for its construction; .2 have all components constructed from material that is corrosion resistant in the marine environment without the need for coatings or galvanizing; and	Part 1, paragraph 6.9.7: The release mechanism, including the simulation equipment, should be mounted on a tensile strength testing device. The load should be increased to at least six times the working load of the release mechanism without failure of the release mechanism.
Static load	Paragraph 6.1.1.5: The launching appliance and its attachments other than winches shall be of sufficient strength to withstand a factory static proof load test of not less than 2.2 times the maximum working load.	Part 2, paragraph 6.1.1: Each launching appliance, except the winch, should be tested with a static load of 2.2 times the working load with the appliance in the full outboard position. For a free-fall lifeboat launching appliance, each launching ramp and its connection to the release mechanism, including the simulation equipment, should be tested with a static load of 2.2 times the working load. The appliance should not be deformed or damaged. Winches with the brakes applied should be tested by applying a static load of 1.5 times the maximum working load. Any cast components of the frame and arm should be hammer-tested to determine that they are sound and without flaw.