

SUB-COMMITTEE ON SHIP DESIGN AND
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Agenda item 7

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MAKING THE PROVISIONS OF MSC.1/CIRC.1206/REV.1 MANDATORY

Proposed amended "Guidelines for evaluation and replacement of lifeboat on-load release mechanisms" referred to in SOLAS regulation III/1.5

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SUMMARY

Executive summary: The industry co-sponsors provide additional discussion of and proposed amendments to the "Guidelines for evaluation and replacement of lifeboat on load release mechanisms" and to chapter IV of the LSA Code

Strategic direction: 5.1

High-level action: 5.1.2

Planned output: 5.1.2.1

Action to be taken: Paragraph 13

Related documents: DE 43/18; DE 44/19; DE 45/27; DE 46/32; DE 47/25; DE 48/25; FP 50/21; DE 50/27; DE 51/28; DE 52/21; DE 53/3/4, DE 53/26; MSC 87/7/5, MSC 87/26; ISWG LRH/2, ISWG LRH/2/3; MSC 88/26

Introduction

1 The Industry Lifeboat Group (ILG) document ISWG LRH/2/3 included amendments relating to the output from the DE 53 LSA working group, and in particular proposed:

- .1 definitions section to maximize consistency of application;
- .2 provision for urgently replacing non-compliant release mechanisms;
- .3 a defined process and criterion for assessing the stability of release mechanisms;
- .4 a provision for an endurance test to demonstrate longevity of safe operation;
- .5 an enhanced compliance review to improve the assessment of design integrity; and

- .6 a requirement for evaluation reports submitted to the Organization to be circulated to Member Governments.

2 The ISWG (20 to 22 October 2010) amended the draft "Guidelines for evaluation and replacement of lifeboat on-load release mechanisms", developed during DE 53 and forwarded them to MSC 88 for approval. The co-sponsors agree that the Guidelines developed by the ISWG are an improvement upon those developed by DE 53, however the co-sponsors have very serious concerns that the Guidelines remain insufficiently robust and are not yet fit for purpose. It is of serious concern that they do not adequately address the crucial issue of design. These concerns held by the shipping industry are shared by a substantial number of IMO members and were brought to the attention of MSC 88.

3 Specifically, shipping industry is concern that the Guidelines developed by the ISWG continue to rely on the assumption that mechanical wear of hook release mechanisms is the primary cause of failure. The co-sponsors firmly believe that the core elements for a safe release mechanism are based on sound and competent design and that the means to assess these aspects namely, design review and hook testing have still not been sufficiently addressed.

Discussion

4 The co-sponsors consider that document ISWG LRH/2/3 provides a detailed and accurate assessment of issues relevant to this matter, consequently proposals now submitted for amendment of the draft Guidelines developed by the ISWG and for the draft amended LSA Code, contained at annex 1 and annex 2, retain the essential elements of document ISWG LRH/2/3. Annex 3 proposes consequential amendments to the new proposed paragraph 5 to SOLAS regulation III/I.

5 It has been difficult to develop technical guidelines that address all release mechanism designs without risking, on the one hand missing a necessary safety factor and on the other hand inadvertently penalizing an otherwise safe release mechanism.

6 Industry Lifeboat Group (ILG) members have carefully considered and reviewed the discussion during MSC 88 as well as the Committee's decisions regarding the evaluation and replacement of lifeboat on-load release mechanisms. The proposed amendments at annex 1 and annex 2 apply a goal-based functional approach that is consistent with IMO philosophy. It is proposed that the design review (paragraph 8 of the draft Guidelines) should require the manufacturer, as defined in the Guidelines, to demonstrate and verify to the Administration that under a defined range of conditions the release mechanism (hook) cannot be opened when the lifeboat is in the davit or suspended from the falls [and can only be opened when the lifeboat is wholly or partly waterborne].

7 In this submission the co-sponsors have sought to focus on the particular concern advised to MSC 88, that the draft Guidelines do not sufficiently address the need to evaluate the design characteristics of a release mechanism (hook). Specifically it is proposed that a manufacturer should be required to demonstrate that if circumstances occur that may lead to failure of the release mechanism (hook) the mechanism will not open unless the crew operate the release mechanism [when wholly or partly waterborne]. The co-sponsors consider that this requirement is fundamental to the safe operation of a ship's lifeboat and that although the aim of the draft guidelines is supportive of this goal such a requirement is not otherwise specifically identified.

Proposal

8 The co-sponsors propose that in order to mitigate the risk of hook failure, the manufacturer (as defined in the Guidelines) should be able to demonstrate and provide evidence to the appropriate Administration that each design of release mechanism (hook) will:

- .1 remain positively closed when subject to vibration and shock levels normally experienced by a ship in a seaway and exposed to anticipated wind and weather conditions;
- .2 remain positively closed when the ship is pitching and/or rolling in a seaway;
- .3 remain positively closed despite misalignment of components that may occur during intervals between required inspection and maintenance;
- .4 remain positively closed in the event of fault or failure of the control rods or cables;
- .5 remain positively closed irrespective of any condition of list or trim that may be experienced during normal operational conditions; and
- .6 open only when the release mechanism is activated [and the lifeboat is wholly or partly waterborne].

9 It is proposed that until existing release mechanisms (hooks) have been assessed and found compliant with these requirements Fall Preventer Devices (FPD) should be used on all release mechanisms (hooks) and that the provisions of MSC.1/Circ.1327 regarding FPD should be made mandatory.

10 Assessment of existing release mechanisms (hooks) as required in the design review, may indicate that compliance with the Guidelines can only be achieved following modification of the mechanism. It is proposed that permanent modification may be achieved by fitting a FPD in the form of a securing pin referred to in MSC.1/Circ.1327, that securely locks the movable hook components of the release mechanism (hook) until the securing pin is removed.

11 The proposal in paragraph 10 indicates acceptance of the risk that should abandonment occur in conditions of fire and or smoke, removing the locking pin with the lifeboat wholly or partially waterborne may be problematic. The co-sponsors consider that the positive and routine safety gain that will be achieved by adopting this proposal significantly outweighs the statistically small risk identified. Manufacturers may additionally make provision for withdrawing "securing pins" from inside a sealed lifeboat.

12 [A number of amendments to the LSA Code are proposed. Crucially amendments to paragraph 4.4.7.6.6.2 require that release mechanisms (hooks) should only be able to open when the lifeboat is wholly or partially waterborne. The risk of a lifeboat being "hung up" and failing to release is considered to be minute when compared to actual cases of injury and death that have occurred when release mechanisms (hooks) have opened and lifeboats fallen to the sea].

Action requested of the Sub-Committee

13 The Sub-Committee is invited to consider this proposal, and decide as appropriate.

ANNEX 1

PROPOSED AMENDMENTS TO DOCUMENT MSC 88/3/4, ANNEX 1

GUIDELINES FOR EVALUATION AND REPLACEMENT OF LIFEBOAT ON-LOAD RELEASE MECHANISMS

Design review

8 Each existing type of lifeboat release and retrieval system should be subject to a design review, which should include a reliability appraisal and compliance assessment.

8.1 The design review shall require the manufacturer to demonstrate and verify to the Administration that the movable hook component of the hook assembly cannot open when the lifeboat is secured in its davits or is suspended from the lifeboat falls, and can only open when the release mechanism is activated [when the lifeboat is wholly or partially waterborne].

8.2 The movable hook component shall not be able to open due to wear, vibration shock, misalignment or unintended force within the hook assembly or operating mechanism, control rods or cables as may be connected to or form part of the hook assembly. These functional criteria should also be demonstrated during endurance testing.

ANNEX 2

PROPOSED AMENDMENTS TO PARAGRAPH 4.4.7.6 OF THE INTERNATIONAL LIFE-SAVING APPLIANCES (LSA) CODE

CHAPTER IV SURVIVAL CRAFT

4.4.7.6 Every lifeboat to be launched by a fall or falls, except a free-fall lifeboat, shall be fitted with a release mechanism complying with the following requirements subject to subparagraph .9 below:

- .1 the mechanism shall be so arranged that all hooks are released simultaneously;
- .1bis notwithstanding paragraph 6.2 the mechanism shall not be able to open when the lifeboat is secured in the davit or is suspended from the lifeboat falls, and must only open when the release mechanism is activated [when the lifeboat is wholly or partly waterborne];
 - .1 the mechanism shall not be able to open due to combinations of wear, vibration, misalignment or unintended force within the hook assembly or operating mechanism, control rods or cables as may be connected to, or form part of the hook assembly and with trim of up to 10° and a list of up to 20° either way.
 - .2 The functional criteria of 4.4.7.6.1bis and 4.4.7.6.1bis.1 apply for the range of loads, representative of the lightest unladen lifeboat to the heaviest laden lifeboat for which the lifeboat release and retrieval system may be approved. [Testing to verify compliance shall include stowed and dynamic lowering and retrieval conditions].
- .2 the mechanism shall be designed so that the hook and the locking mechanism remains fully closed under any operational conditions until it is deliberately caused to open by means of the operating mechanism:
 - .1 for designs that utilize rotating components, including those utilizing a hook tail and cam, the mechanism shall continue to comply with this requirement through rotation of the cam or equivalent device of up to 45 degrees in either direction from its locked position;
- .3 the mechanism shall be designed so that, when it is fully reset in the closed position, the weight of the lifeboat does not cause any force to be transmitted to the operating mechanism, which could cause the inadvertent release of the lifeboat;
- .4 locking devices shall be designed so that they cannot turn open due to forces from the hook load;
- .5 if a hydrostatic interlock is provided, it shall automatically reset upon lifting the boat from the water;

- .6 the mechanism shall have two release capabilities; normal (off-load) release capability and on-load release capability:
- .6.1 normal (off-load) release capability shall release the lifeboat when it is waterborne or when there is no load on the hooks, and not require manual separation of the lifting ring or shackle from the jaw of the hook; and
- .6.2 on-load release capability shall release the lifeboat with a load on the hooks, only with the lifeboat wholly or partially waterborne. This release shall so be arranged as to release the lifeboat under any conditions of loading from no load ~~with the lifeboats waterborne~~ to a load of 1.1 times the total mass of the lifeboat when loaded with its full complement of persons and equipment, only with the lifeboat wholly or partially waterborne. This release capability shall be adequately protected against accidental or premature use. Adequate protection shall include special mechanical protection not normally required for off-load release, in addition to a danger sign. The release mechanism shall be provided with a hydrostatic interlock unless other means are provided to indicate that the boat is waterborne. To prevent a premature on-load release, on-load operation of the release mechanism shall require deliberate and sustained action or actions by the operator.
- .7 to prevent an accidental release during recovery of the boat, unless the hook is completely reset, either the hook shall not be able to support any load, or the handle or safety pins shall not be able to be returned to the reset (closed) position ~~without excessive force~~. Additional danger signs shall be posted at each hook station to alert crew members to the proper method of resetting;
- .8 all components of the hook unit, release handle unit, control cables or mechanical operating links and the fixed structural connections in a lifeboat shall be of material corrosion resistant in the marine environment without the need for coatings or galvanizing. Design and manufacturing tolerances shall be such that anticipated wear throughout the service life of the mechanism shall not adversely affect its proper functioning. Mechanical operating links such as control cables shall be waterproof and shall have no exposed or unprotected areas;
- .9 the release mechanism shall be so designed and installed that crew members from inside the lifeboat can ~~clearly~~ unambiguously determine when the system is ready for lifting by:
- 9.1 directly observing that the movable hook portion or the hook portion that locks the movable hook portion in place is properly and completely reset at each hook; or
- 9.2 observing a non-adjustable indicator that confirms that the mechanism that locks the movable hook portion in place is properly and completely reset at each hook; or

- 9.3 easily operating a mechanical indicator that confirms that the mechanism that locks the movable hook in place is properly and completely reset at each hook;
- .10 clear operating instructions shall be provided with a suitably worded warning notice using colour coding, pictograms, and/or symbols as necessary for clarity. If colour coding is used, green shall indicate a properly reset hook and red shall indicate danger of improper or incorrect setting;
- .11 the release control shall be clearly marked in a colour that contrasts with its surroundings;
- .12 means shall be provided for hanging-off the lifeboat to free the release mechanism for maintenance;
- .13 the fixed structural connections of the release mechanism in the lifeboat shall be designed with a calculated factor of safety of 6 based on the ultimate strength of the materials used, and the mass of the lifeboat when loaded with its full complement of persons, fuel and equipment, assuming the mass of the lifeboat is equally distributed between the falls, except that the factor of safety for the hanging-off arrangement may be based upon the mass of the lifeboat when loaded with its full complement of fuel and equipment plus 1,000 kg; and
- .14 where a single fall and hook system is used for launching a lifeboat or rescue boat in combination with a suitable painter, the requirements of paragraphs 4.4.7.6.2.2 and 4.4.7.6.3 need not be applicable; in such an arrangement a single capability to release the lifeboat or rescue boat, only when it is fully waterborne, will be adequate.

ANNEX 3

PROPOSED MODIFICATIONS TO THE DRAFT AMENDMENTS TO SOLAS REGULATION III/1*

CHAPTER III – LIFE-SAVING APPLIANCES AND ARRANGEMENTS

Regulation 1 – Application

The following new paragraph 5 is added after the existing paragraph 4:

"5 Notwithstanding paragraph 4.2, for all ships, not later than the first scheduled dry-docking after [date], lifeboat on-load release mechanisms not complying with paragraphs 4.4.7.6.3 to 4.4.7.6.5 4.4.7.6.1 and 4.4.7.6.3 to 4.4.7.6.5 and 4.4.7.6.9 of the Code shall be replaced with equipment that complies with the Code."

* Refer to the Guidelines for evaluation and replacement of lifeboat release and retrieval systems (MSC.1/Circ...).