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SUB-COMMITTEE ON STABILITY AND
LOAD LINES AND ON FISHING VESSELS
SAFETY

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Agenda item 6

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REVIEW OF THE INTACT STABILITY CODE

Proposed amendments to the IS Code

Submitted by Poland

SUMMARY

Executive summary: This document contains proposed amendments to the IS Code (resolution A.749(18)) as amended by resolution MSC.75(69) submitted by Poland at the forty-second and forty-third sessions and resubmitted following the decision of the forty-fourth session of SLF (paragraph 17.4 of SLF 44/18)

Action to be taken: Paragraph 8

Related documents: IS Code, SLF 42/INF.10, SLF 43/INF.7, SLF 43/INF.8, SLF 43/INF.9

1 Having reviewed the Code of Intact Stability for All Types of Ships Covered by IMO Instruments (resolution A.749(18)), as amended by resolution MSC.76(69) Poland offered at previous sessions of SLF proposals of amendments to be included in the revised version of the Code. Following the decision of SLF 44 (paragraph 17.4 of document SLF 44/18) those documents after being reviewed by Poland are resubmitted to this session. The amendments relate to sections 2.3; 3.1; 3.3; 4.11 and 6.7.

2 Chapter 2 – General provisions against capsizing and information for the master Section 2.3 – Operating booklets for certain ships

It is proposed to add new items: 2.3.4, 2.3.5, 2.3.6, 2.3.7 and 2.3.8 at the end of the section, as follows:

“2.3.4 Information concerning conditions of ensuring steering capability of the ship in extreme heavy weather which may be encountered in the operating area shall be included in the stability booklet of passenger ro-ro ships.”*

* Guidance to the master for avoiding dangerous situations in following and quartering seas (MSC/Circ.707) is referred to.

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Reason

The investigation of the disaster of a Polish ro-ro passenger ship (in 1993) has covered parameters of steering capabilities in heavy weather conditions which were encountered on the course. The results of the simulation with the computer programme have proved that the steering capabilities of the ship should be taken into account by the master during navigation in heavy weather conditions to be prepared for every manoeuvre, if any. The circumstances under which ro-ro passenger ships are operated (i.e. timetable, etc.) and large windage area support the proposed amendment.

- "2.3.5 *The stability booklet of ships to which subdivision and damage stability requirements apply should contain the data and information necessary for the master to maintain sufficient intact stability under service conditions to ensure that the ship withstands the critical damage.*
- 2.3.6 *For passenger ships, to enable the master to maintain sufficient intact stability the data and information referred to in 2.3.4 shall include information which indicates the maximum permissible height of the ship's centre of gravity above keel (KG) or alternatively the minimum permissible metacentric height (GM) for a range of draughts or displacements sufficient to include all service conditions. The information shall show the influence of various trims taking into account the operational limits.*
- 2.3.7 *For cargo ships to which the International Convention for the Safety of Life at Sea, 1974, chapter II-1 part B-1 applies, the data and information referred to in 2.3.4 should comply with regulation II-1/25-8 of this Convention.*
- 2.3.8 *For bulk carriers to which the International Convention for the Safety of Life at Sea, 1974, chapter XII applies, the data and information referred to in 2.3.4 should comply with regulations VI/6, VI/7 and XII/8 of this Convention."*

Reasons:

- 1 The stability booklet should take into account both sets of criteria in order to enable the ship to operate in compliance with intact stability criteria (established by the Administration) and damage stability criteria (obligatory according to Convention).
- 2 The provisions of the regulations, referred to in this paper, provide that the intact and damage stability criteria are to be applied as one set of criteria in order to prepare the required information for the master.
- 3 **Chapter 3 – Design criteria applicable to all ships**
Section 3.1 – General intact stability criteria for all ships

It is proposed to insert a new item 3.1.3 at the end of section:

"3.1.3 Intact stability criteria associated with required damage stability criteria

Sufficient intact stability shall be provided in all service condition to enable ships to comply with, in addition to the criteria given in 3.1.2 and in chapter 4 (where applicable), damage stability criteria after flooding, required in the IMO instruments."

4 Chapter 3 - Design criteria applicable to all ships
Section 3.3 - Effect of free surface of liquids in tanks

It is proposed to add a new item 3.3.6.1 after item 3.3.6 and to renumber as follows:

"3.3.6.1 Where gutter bars are installed on the weather deck of tankers, the free surface effects caused by liquids contained by the gutter bars should be considered as follows:

3.3.6.1.1 For tankers with gutter bars installed on the weather deck in way of cargo manifolds and extended aft as far as the after house front [for the purpose of containing cargo spills on deck during loading and discharge operations] the free surface effects caused by containment of a cargo spill during liquid transfer operations or of shipping seas while under way require consideration with respect to the ship's available margin of positive initial metacentric height.

3.3.6.1.2 On ships without deck camber or where the height of the installed gutter bars exceeds the camber, and for tankers having cargo tanks exceeding 60% of the ship's maximum beam at midships regardless of gutter bar height, the initial metacentric height to be assessed for compliance with relevant intact stability requirements taking into account the free surface effects caused by liquids contained by the gutter bars."

Reasons

- 1 The provisions referred to the free surface effects for tankers and ships with gutter bars installed on the weather deck as unified interpretation of regulation 26 of the 1966 LL Convention are inserted in the set of unified interpretation, item 6 of the annex to LL.3/Circ.130.
- 2 The most convenient access, for users, to the above provisions is ensured when they are placed together with the other provisions related to the free surface effects and constitute one set in one place.
- 3 The proposed amendment of section 3.3 of the IS Code allows easy access and proper information about requirements for free surface effects.

5 Chapter 4 - Special criteria for certain types of ships
Section 4.11

It is suggested to add a new section 4.11 after the existing section 4.10 with renumeration adjusted to the IS Code, as follows:

*"4.11 Tankers***4.11.1 Scope*

The provisions given hereunder apply to oil tankers of 5000 tons deadweight and above:

- .1 for which the building contract is placed on or after 1 February 1999;*
- .2 in the absence of a building contract, the keels of which are laid or which are at a similar stage of construction on or after 1 August 1999; or*
- .3 the delivery of which is on or after 1 February 2002; or*
- .4 which have undergone a major conversion:*
 - .1 for which the contract is placed after 1 February 1999; or*
 - .2 in the absence of a contract, the construction work of which is begun after 1 August 1999; or*
 - .3 which is completed after 1 February 2002*

4.11.2 Intact stability criteria

4.11.2.1 Every oil tanker shall comply with the intact stability criteria specified in 4.11.2.2 and 4.11.2.3, as appropriate, for any operating draught under the worst possible conditions of cargo and ballast loading, consistent with good operational practice, including intermediate stages of liquid transfer operations. Under all conditions the ballast tanks shall be assumed slack.

4.11.2.2 In port, the initial metacentric height, corrected for free surface measured at 0° heel, shall be not less than 0.15 m.

4.11.2.3 At sea, the following criteria shall be applicable:

- .1 the area under righting lever curve (GZ curve) shall be not less than 0.055 m.rad up to $\Theta f = 30^\circ$ angle of heel and not less than 0.09 mrad up to $\Theta f = 40^\circ$ or other angle of flooding Θf^* if this angle is less than 40° . Additionally, the area under the righting lever curve (GZ curve) between the angles of heel of 30° and 40° or between 30° and Θf , if this angle is less than 40° , shall be not less than 0.03 m.rad;*
- .2 the righting lever GZ shall be at least 0.20 m at an angle of heel equal to or greater than 30° ;*

* Refer to regulation 25A of Annex I of MARPOL 73/78 (resolution MEPC.75(40)).

* Θf is the angle of heel at which openings in the hull, superstructures or deck-houses, which cannot be closed weathertight, immerse. In applying this criterion, small openings through which progressive flooding cannot take place need not be considered as open.

- .3 *the maximum righting arm shall occur at an angle of heel preferably exceeding 30° but not less than 25°; and*
- .4 *the initial metacentric height, corrected for free surface measured at 0° heel, shall be not less than 0.15 m.*

4.11.3 *The requirements specified in 4.11.2 shall be met through design measures. For combination carriers, simple supplementary operational procedures may be allowed.*

4.11.4 *Operational procedures for liquid transfer operations.*

Simple supplementary operational procedures for liquid transfer operations, referred to in 4.11.3, shall mean written procedures made available to the master which:

- .1 *are approved by the Administration;*
- .2 *indicate those cargo and ballast tanks which may, under any specific condition of liquid transfer and possible range of cargo densities, be slack and still allow the stability criteria to be met. The slack tanks may vary during the liquid transfer operations and be of any combination, provided they satisfy the criteria;*
- .3 *will be readily understandable to the officer-in-charge of liquid transfer operations;*
- .4 *provide for planned sequences of cargo/ballast transfer operations;*
- .5 *allow comparisons of attained and required stability using stability performance criteria in graphical or tabular form;*
- .6 *require no extensive mathematical calculations by the officer-in-charge;*
- .7 *provide for corrective actions to be taken by the officer-in-charge in case of departure from recommended values and in case of emergency situations; and*
- .8 *are prominently displayed in the approved trim and stability booklet and at the cargo/ballast transfer control station and in any computer software by which stability calculations are performed.”*

Reasons

- 1 New regulation 25A of Annex I of MARPOL 73/78 contains the stability criteria for tankers and entered into force on 1 February 1999.
- 2 In order to keep the IS Code up to date, the requirements covered by regulation 25A of Annex I of MARPOL 73/78 need to be included into the said Code.

Chapter 6 – Considerations for watertight integrity
Section 6.7 – Ventilators, air pipes and sounding devices

It is suggested to add a new item 6.7.5 at the end of the section, as follows:

“6.7.5 Air pipes from transverse tanks connected to allow gravity filling of both tanks after damage to one of them and to ensure symmetrical flooding of damaged compartment shall be so designed that the outflow of liquids occurs at an angle of inclination greater than [50°].”

Reasons

The investigation of the disaster of a Polish ro-ro passenger ship concerning the capsizing process has shown that the case of transverse tanks which are connected to get symmetrical flooding after damage may lead to the outflowing of liquid by air pipes at small angle of inclination of the ship.

The outflow of liquid occurs on the submerged side of the ship, while a tank located on the emerged side is emptying. The result of such outflow is lowering of the righting arm GZ caused by moving position of the centre gravity of the ship towards the submerged side.

The proposed value [50°] can be agreed taking into account the positive range of GZ.

The proposal allows to avoid the inner reason of lowering the value of GZ which appears to be negative during a capsizing of the ship.

7 Editorial remark

Having revived the printed text of the IS Code, Poland suggests text of all formulae be printed using formulae editor. At present many formulae, especially those containing fractional expressions, e.g. in chapter 4, are not clear; they should be written using horizontal stroke (not "slash" line), good example: see the IGC Code edition IMO, 1993.

8 Action requested of the Sub-Committee

The Sub-Committee is invited to note the proposals submitted and to take action as appropriate.
