MSC/Circular.649 – International Convention for the Safety of Life at Sea, 1974, as amended – (Adopted on 8 June 1994)

Parent topic: Maritime Safety Committee

The Maritime Safety Committee

1 The Maritime Safety Committee, at its sixtieth session (6 to 10 April 1992), adopted, by resolution MSC.26(60), an amendment to chapter II-1 of the 1974 SOLAS Convention introducing retroactive regulations in respect of residual stability standards for existing ro-ro passenger ships.

2 To ensure that this upgrading procedure would proceed in a logical and orderly manner, a calculation method was agreed whereby a ratio, A/A_{max}, was to be used to establish a ranking order for the upgrading process. The annex to MSC/Circular.574 gives details of this calculation method, which is a simplified version of the probabilistic parts of resolution A.265(VIII).

3 Recognizing the need for consistent guidance, the Maritime Safety Committee, at its sixty-third session (16 to 25 May 1994), approved interpretations of the provisions of resolution MSC.26(60) and MSC/Circular.574 developed by the Sub-Committee on Stability and Load Lines and on Fishing Vessels Safety as set out in the annex.

4 Member Governments are invited to use these interpretations when applying amendments to the 1974 SOLAS Convention, adopted by resolution MSC.26(60), and the calculation procedure for assessing the survivability characteristics of existing ro-ro passenger ships set out in MSC/Circular.574.

Parent topic: MSC/Circular.649 – International Convention for the Safety of Life at Sea, 1974, as amended – (Adopted on 8 June 1994)

Annex - Interpretations of Provisions of Resolution MSC.26 (60) and MSC/Circular.574

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1 Residual righting level curve - (paragraph 2.4 , annex to MSC/Circluar.574)

When determining the positive righting levers, GZ, of the residual stability curve, the displacement used should be that of the intact condition. That is, the constant displacement method of calculation should be used.

Parent topic: Annex - Interpretations of Provisions of Resolution MSC.26(60) and MSC/Circular.574

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2 Potential downflooding openings - (resolution MSC.26(60))

2.1 Where the location of openings can lead to significant downflooding, they should be taken properly into account when carrying out the A/A_{max} calculations. Their status should be identified by an on-board survey and the details of such openings should be updated, if necessary, on the damage control plan.

2.2 When carrying out the calculations to establish the A/A_{max} ratio, such downflooding openings should be assumed closed watertight, or weathertight, as appropriate.

2.3 In order that a contribution to the `A' value can be made, such downflooding openings should be closed to a credible degree of tightness. Where internal doors are shown to be situated above both the intermediate and final waterlines after assumed damage, they are not required to be strictly watertight.

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3 Permeabilities to be used in the A/Amax calculation - (SOLAS regulation II-1/8.3 and MSC/Circular.574)

3.1 The Convention permeability of 60% for cargo spaces is too low for use with ro-ro cargo spaces. A value of 90% should be assumed for ro-ro cargo spaces above the bulkhead deck.

3.2 When spaces below the bulkhead deck are appropriated for the use of cargo, a permeability of 60% can be used only where it is demonstrated that such spaces regularly contain cargo, other than ro-ro cargo. Otherwise, a permeability of 95% should be assumed. That is, the space should be treated as a void space.

3.3 When spaces are appropriated for the carriage of liquids, a permeability value of 95% should be assumed, unless such spaces are to be permanently filled with ballast in the form of liquid. That is, the liquid should be used as “lock-in" ballast.

Parent topic: Annex - Interpretations of Provisions of Resolution MSC.26(60) and MSC/Circular.574

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4 Assumed damage penetration in way of sponsons

If sponsons are fitted, it is necessary to establish the maximum assumed damage penetration (B/5) to be used when deciding on the various damage cases. For this purpose, the breadth 'B' in way of such sponsons should be measured to the outside of the sponsons. Clear of any such sponsons, the breadth 'B' should be the midship breadth measured to the outside of the original shell. In other words, the assumed penetration of B/5, is the same as that which applied before the fitting of sponsons.

Parent topic: Annex - Interpretations of Provisions of Resolution MSC.26(60) and MSC/Circular.574

5 Calculation of the A/Amax ratio - (resolution MSC.26(60) and MSC/Circular.574)

5.1 Identical assumptions should be made regarding the extent of damage penetration when calculating the `A' values for both the actual and notional ship KG values. This damage penetration extent should be no less than B/5, measured inboard from the ship side. However, contributions to these `A' values may be included for damage cases involving penetration extents in excess of B/5.

5.2 Where there is longitudinal bulkhead nearer to the ship side than B/5, it should be assumed to be penetrated. In such a case, there may be a further damage case to be considered within the same longitudinal damage zone. Both the 'A' values should be calculated accordingly.

5.3 Where a ship has been constructed to a two-compartment standard of subdivision, 'A' should be calculated using a notional ship KG appropriate to that for which the 's' values calculated for the two-compartment damage cases are unity. In such a case, it may be assumed that all the 's' values for the one-compartment damage cases are also unity. The corresponding A/A_{max} ratio is then given by the ratio:

$$\frac{A1+A2}{A_{max}1+A_{max}2}$$

where:

***A*1** = is that part of the 'A' value calculated for the one-compartment damage cases, using the actual KG;

***A*2** = is that part of the 'A' value calculated for the two-compartment damage cases, using the actual KG;

A_{max} **1** = is that part of the 'A' value calculated for the one-compartment damage cases, using the notional KG;

A_{max} **2** = is that part of the 'A' value calculated for the two-compartment damage cases, using the notional KG;

5.4 Where a ship has been constructed to a one-compartment standard of subdivision, 'A' should be calculated using a notional ship KG appropriate to that for which all the 's' values calculated for the

one-compartment damage cases are unity. For the purposes of future analysis, the A/A_{max} ratio should be calculated using the formula:

$$\frac{A1+A2}{A_{max}1+A2}$$

Parent topic: Annex - Interpretations of Provisions of Resolution MSC.26(60) and MSC/Circular.574

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6 Acceptance of A/Amax calculations by the Administration - (resolution MSC.26(60))

6.1 Where the A/A_{max} ratio, expressed as a percentage, for a ship is 95% or more, the Administration should accept that the requisite survivability standard for that ship has been achieved, and it should consequently be exempt from the upgrading process.

6.2 The survivability of a ship may be upgraded step by step, in accordance with the scale outlined in regulation II-1/8.9 of the SOLAS convention adopted by resolution MSC.26(60). In such a case, a further A/A_{max} calculation should be performed, and then approved by the Administration, prior to the date specified by which the further upgrading should be completed.

6.3 The residual stability standard to be achieved after upgrading should correspond to the modified SOLAS 90 stability criteria as expressed in regulation II-1/8.2.3.5 of the SOLAS Convention, adopted by resolution MSC.26(60).

6.4 The Administration, on receiving the A/A_{max} calculation for a ship, should confirm that the calculation has been made according to the procedure outlined in MSC/Circular.574, together with any agreed interpretations, and, in particular, that specific approval is given for the A/A_{max} ratio.

Parent topic: Annex - Interpretations of Provisions of Resolution MSC.26(60) and MSC/Circular.574

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7 Ships subject to modifications of a major character - (resolution MSC.26(60) and regulation II-1/1.3.2 of the SOLAS Convention, as amended)

When alternations have been made to a ship which are intended solely to achieve a higher survivability standard, they should not be regarded as modifications of a major character.

Parent topic: Annex - Interpretations of Provisions of Resolution MSC.26(60) and MSC/Circular.574

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8 Ships constructed to resolution A.265(VIII)

The subdivision and stability requirements of resolution A.265(VIII) should be regarded as fully equivalent to the subdivision and stability standards represented by the SOLAS 90 standard adopted by resolution MSC.12(56). Therefore, ships constructed, or modified, such that they are in full compliance with the provisions of resolution A.265(VIII), should be considered to have a survivability standard equal to that provided by the SOLAS 90 standard. As a consequence, such ships need not be subject to any upgrading process, and should not be considered as part of any A/A_{max} calculation exercise.

Parent topic: Annex - Interpretations of Provisions of Resolution MSC.26(60) and MSC/Circular.574
