



TECHNICAL INFORMATION

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Subject: Amendments to SOLAS II-1 / Reg.3-8 "Towing and mooring equipment" implemented on 1 January 2024

1. Back ground

New ship designs, and especially the design of large ships, have resulted in optimized performance and a greater degree of complexity. It is, however, a widely recognized fact that the development and design of mooring systems has not adequately followed the development of ships. Despite efforts to improve how safe mooring operations, we still experience a high number of accidents during these operations.

To relieve this issue, amendments to SOLAS II-1/3-8 "Towing and mooring equipment" were adopted by the Maritime Safety Committee at MSC 102 and will enter into force on or after 1 January 2024. These amendments introduce new safety requirements for design, selection, inspection, maintenances and replacement of mooring and towing arrangements in conjunction with MSC.1/Circ.1175/ Rev.1, MSC.1/Circ.1619 and MSC.1/Circ.1620.

2. Definition for towing and mooring equipment

- 1) **Safe Working Load (SWL)** means the safe load limit of shipboard fittings used for mooring operations.
- 2) **Ship Design Minimum Breaking Load (MBL_{SD})** means the minimum breaking load of new, dry mooring lines for which shipboard fittings and supporting hull structures are designed in order to meet mooring restraint requirements or the towing requirements of other towing service.
- 3) **Line Design Break Force (LDBF)** means the minimum force at which a new, dry, spliced mooring line will break at. This is for all synthetic cordage material. This value is declared by the manufacturer on each line's mooring line certificate and data sheet. LDBF of a line should be 100%-105% of the ship design minimum breaking load (MBL_{SD}).
- 4) **Working Load Limit (WLL):** the maximum load that a mooring line should be subjected to in operational service. The WLL is expressed as a percentage of MBL_{SD} and should be used as a limiting value in operational mooring analyses. Steel wires have a WLL of 55% of MBL_{SD} and all other cordage (synthetic) have a WLL of 50% of the MBL_{SD}.
- 5) **Bend radius (D/d ratio)** means the diameter (D) of a mooring fitting divided by the diameter (d) of a mooring line that is led around or through the fitting.

6) Towing and mooring arrangements plan means the plan as described in section 5 of the annex to the revised guidance on shipboard towing and mooring equipment (MSC.1/Circ.1175/Rev.1). This plan presents specific information regarding the towing and mooring fittings aboard the vessel, the mooring lines, as well as the arrangement of mooring lines and the acceptable environmental conditions for mooring.

3. New regulation and instruments for towing and mooring equipment (SOLAS II-1/Reg.3-8)

New SOLAS II-1/Reg.3-8	Related instruments	Application
<p>SOLAS II-1/Reg.3-8.4 Ships shall be provided with arrangements, equipment and fittings of sufficient safe working load to enable the safe conduct of all towing and mooring operations associated with the normal operation of the ship.</p>	<p>MSC.1/Circ.1175 Guidance on shipboard towing and mooring equipment.</p>	<p>Ships constructed on or after 1 January 2007(K/L) but before 1 January 2024 The expression “constructed before 1 January 2024” should mean ships not subject to SOLAS II-1/Reg.1.3.2.</p>
<p>SOLAS II-1/Reg.3-8.5 Arrangements, equipment and fittings provided in accordance with Reg.3-8.4 shall meet the appropriate requirements of the Administration or RO.</p>	<p>MSC.1/Circ.1175/Rev.1 Guidance on shipboard towing and mooring equipment.</p>	<p>Ships constructed on or after 1 January 2024 As per SOLAS II-1/Reg.1.3.2, the expression “ships constructed on or after 1 January 2024” means ships; .1 for which the building contract is placed on or after 1 January 2024; or .2 in the absence of a building contract, the keel of which is laid or which are at a similar stage of construction on or after 1 July 2024; or .3 the delivery of which is on or after 1 January 2028¹.</p>

¹ For the Liberia flag's vessels, the delivery date is January 1, 2027 in accordance with Marine Notice SAF-012 Rev.07/23. Unless the flag administration explicitly requests the delivery date, For ships registered with KR, the delivery date is applied as January 1, 2028 as discussed in MSC102. (paragraph 3.4 of MSC 102/24)

New SOLAS II-1/Reg.3-8	Related instruments	Application
<p>SOLAS II-1/Reg.3-8.7 For ships of 3,000 gross tonnage and above, the mooring arrangement shall be designed, and the mooring equipment including lines shall be selected, in order to ensure occupational safety and safe mooring of the ship, based on the guidelines developed by the Organization. Ship-specific information shall be provided and kept on board.</p> <p>SOLAS II-1/Reg.3-8.8 Ships of less than 3,000 gross tonnage should comply with the requirement in paragraph 7 above as far as reasonably practicable, or with applicable national standards of the Administration.</p>	<p>MSC.1/Circ.1619 Guidelines on the design of mooring arrangements and the selection of appropriate mooring equipment and fittings for safe mooring.</p>	<p>As per SOLAS II-1/Reg.3-8.2 Ship: .1 for which the building contract is placed on or after 1 January 2024; or .2 in the absence of a building contract, the keel of which is laid or which is at a similar stage of construction on or after 1 July 2024; or .3 the delivery of which is on or after 1 January 2027.</p>
<p>SOLAS II-1/3-8.9 For all ships, mooring equipment, including lines, shall be inspected and maintained in a suitable condition for their intended purposes.</p>	<p>MSC.1/Circ.1620 Guidelines for inspection and maintenance of mooring equipment including lines.</p>	<p>All ships after 1 January 2024 As per SOLAS II-1/Reg.1.3.3, the expression "all ships" mean ships constructed before, on or after 1 January 2009.</p>

4. Actions to be taken

1) While applying the SOLAS II-1/Reg.3-8.4, 3-8.5 and 3-8.8, for new ships of less than 3,000 gross tonnage, the following is prepared on board:

- (1) The "Towing and mooring arrangements plan" should provide the following;
 - The maximum brake holding load of mooring winches
 - Information according to the paragraph 5 of MSC.1/Circ.1175/Rev.1
- (2) A mill sheet of the mooring lines;
- (3) The properties of mooring lines related to LDBF and bend radius (D/d ratio).
 - Including warning that the wear rate of lines may be higher for lower diameter. (paragraph 5.6 of MSC.1/Circ.1620)

➤ **At initial survey of the ship, the surveyor should confirm that the plan and documents should be provided on board for the above information.**

2) While applying the SOLAS II-1/Reg.3-8.4, 3-8.5 and 3-8.7, for new ships of 3,000 gross tonnage and above, the following should be prepared on board in addition to those specific above 1):

- (1) A document should be provided for information and as a supplement to the towing and mooring arrangements plan, confirming that MSC.1/Circ.1619 has been considered;
- (2) Justification and suitable safety measures related to the deviations from requirements in MSC.1/Circ.1620 should be provided included in the supplement to the towing and mooring arrangements plan if there are deviations (paragraph 6 of MSC.1/Circ.1619);
- (3) If deviations are not found necessary, and the supplement is not needed, then this should be mentioned explicitly in the towing and mooring arrangements plan;
- (4) The maximum brake holding load of mooring winches should be less than 100% of the Ship Design Minimum Breaking Load (MBLSD) (paragraphs 5.2.3.3 and 5.2.4 of MSC.1/Circ.1619); and
- (5) The winches should be fitted with brakes that allow for the reliable setting of the brake rendering load.

➤ **At initial survey of the ship, the surveyor should confirm that the towing and mooring arrangements plan and the supplement describing deviations and suitable safety measures are provided on board.**

3) While applying the SOLAS II-1/Reg.3-8.9, for all ships (new / existing ship), the following should be satisfied and prepared on board from 1 January 2024:

- (1) Procedures for mooring operations, inspection and maintenance of mooring equipment, including mooring lines, should be established and available on board by taking into account industry practices² (paragraph 3.1 of MSC.1/Circ.1620);
 - (2) Procedures to allow the identification and control of mooring lines, tails and associated attachments should be established and available on board (paragraph 3.3 of MSC.1/Circ.1620);
 - (3) The periodic inspection of mooring lines, mooring line tails and associated attachments should be included in the onboard maintenance plan or equivalent maintenance management system (paragraph 4.1.1 of MSC.1/Circ.1620);
 - (4) Replacement of mooring lines for use should be decided by manufacturers' criteria (paragraph 4.3.1 of MSC.1/Circ.1620);
 - (5) Records of the original design concept, equipment, arrangements and specifications should be available on board (paragraph 4.4.4 of MSC.1/Circ.1620);
 - For ships the keels of which were laid before 1 January 2007 and without appropriate documentation, owners may establish the MBL_{SD} for mooring based on the safe working load of mooring equipment provided on board.
 - If no safe working load of mooring equipment is specified, owners are advised to check strength of mooring equipment and their supporting hull structure based on MSC.1/Circ.1175/Rev.1 and determine MBL_{SD} based on actual capacity of the equipment and their supporting hull structure on board.
 - Manufacturers' test certificates for mooring lines, joining shackles and synthetic tails should be kept on board (paragraph 6.2 of MSC.1/Circ.1620).
 - (6) The records of inspection and maintenance of mooring equipment and inspection and replacement of mooring lines should be kept updated and available on board (paragraphs 4.4.3 and 6.1 of MSC.1/Circ.1620);
 - (7) After 1 January 2024, when the mooring lines needs to be replaced, LDBF of the mooring lines should be in principle selected at 100~105% of MBL_{SD}. However, when using mooring lines with LDBF exceeding 105% of MBL_{SD}, appropriate reviews shall be made regarding the load limits on the hull support structures, mooring equipment and accessories and safety during mooring operations.
- **The surveyor should confirm that procedure and related records are provided on board at the initial survey for new ships or at the first periodical survey (annual, intermediate or renewal) of Cargo Ship Safety construction or Passenger Ship Safety for existing ship on or after 1 January 2024.**

² Refer to the industry practices as below.

- Oil Companies International Marine Forum (OCIMF), Mooring Equipment Guidelines, 4th Edition 2018, ISBN: 978-1-85609-771-0
- INTERTANKO Guidance on Line Management Plans (MP) - Line-management-plans_web-22-2-2019
- INTERTANKO Guidance on Mooring System Management Plans (MSMP) - Mooring_web_22_2_2019
- Mooring and Anchoring Ships Vol.1, Principle and Practice, ISBN: 9781906915934, 2009
- Mooring and Anchoring Ships Vol.2, Inspection and Maintenance, ISBN: 9781870077941, 2009.

5. Attachment

- 1) MSC.1/Circ.1175/Rev.1 Guidance on shipboard towing and mooring equipment
- 2) MSC.1/Circ.1619 Guidelines on the design of mooring arrangements and the selection of appropriate mooring equipment and fittings for safe mooring
- 3) MSC.1/Circ.1620: Guidelines for inspection and maintenance of mooring equipment including lines
- 4) MSC.1/Circ.1362/Rev.2 UNIFIED INTERPRETATION OF SOLAS CHAPTER II-1

* Distribution : KR surveyors, Ship builder, Ship owner/operators and other relevant parties.

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