

SUB-COMMITTEE ON SHIP DESIGN AND
CONSTRUCTION
4th session
Agenda item 11

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**REVISED SOLAS REGULATION II-1/3-8 AND ASSOCIATED
GUIDELINES (MSC.1/CIRC.1175) AND NEW GUIDELINES
FOR SAFE MOORING OPERATIONS FOR ALL SHIPS**

Comments on document SDC 4/11

Submitted by the Oil Companies International Marine Forum (OCIMF)

SUMMARY

Executive summary: This document provides comments on the report of the Correspondence Group on Safe Mooring Operations and in particular, on the proposed draft *Guidelines on the design of safe mooring arrangements*

Strategic direction: 5.2

High-level action: 5.2.1

Output: 5.2.1.1

Action to be taken: Paragraph 21

Related document: SDC 4/11

Introduction

1 This document is submitted in accordance with the provisions of paragraph 6.12.5 of the document on *Organization and method of work of the Maritime Safety Committee and the Marine Environment Committee and their subsidiary bodies* (MSC-MEPC.1/Circ.5) and provides comments on the report of the Correspondence Group on Safe Mooring Operations, as set out in document SDC 4/11 (Denmark and Japan).

2 OCIMF first produced industry guidance on mooring equipment in 1992, and has been regularly updating this guidance to ensure continuous improvement. The latest third Edition of the "Mooring Equipment Guidelines" (MEG3) was published in 2008, and is currently undergoing a review towards the fourth Edition by a multi-faceted team of industry representatives.

3 OCIMF is supportive of the goal-based, holistic approach taken as it focusses on the effectiveness of mooring as a total system that comprises human, operational and technical factors, and not a set of individual components.

4 OCIMF is of the opinion that the increased focus on improvements in human centred design can positively impact on the safety and well-being of ship and shore personnel when operating in (or around) mooring equipment, as failure of equipment within the mooring system impacts the safety of personnel and the ship, and cannot be an acceptable option.

Discussion

5 In considering annex 2 to the Group's report, OCIMF is of the view that additional clarity and discussion on the content of the proposed draft *Guidelines on the design of safe mooring arrangements* will be advantageous to ensure maximum benefit is gained from the work carried out so far within the Correspondence Group. However, OCIMF notes that by linking the draft Guidelines to the proposed amendment to SOLAS regulation II-1/3-8, a situation is created where the draft Guidelines become de facto "prescriptive guidance" and, therefore, OCIMF urges caution in the use of subjective terms, such as "sufficient", used in paragraphs 5.2.1 and 5.2.3.1 of the draft Guidelines, which can be open to interpretation by different stakeholders and Administrations. Based on the analysis arising from the OCIMF's ongoing work, it is also considered that an opportunity exists to further enhance the draft Guidelines in the areas outlined in paragraphs 6 to 20 below.

Mooring lines – selection, identification, and use of mooring lines

6 It is imperative that the initial design philosophy of the ship clearly establishes the environmental forces that are anticipated to impact upon the ship during its life cycle, and that this understanding is carefully considered in the initial selection and identification of the type and number of mooring lines that make up this component of the mooring system.

7 OCIMF fully supports the recommendation in paragraphs 34.4 and 34.5 of the Group's report, that industry guidance should be considered. In this respect, the draft Guidelines should provide clarity on how to achieve the goal outlined in paragraph 36 of the report, specifically the inclusion of this detailed information in the ship's SMS.

8 When undertaking the review to identify the correct mooring line, due consideration should be given to the factors that may impact the effectiveness of a mooring line in service, including issues such as use of chocks, indirect leads and D:d ratios. Mooring line materials differ significantly across the spectrum of products now available and, therefore, should not be seen as equal in their characteristics and performance, particularly where some are highly complex and technical in their construction (e.g. HMSF). Mooring lines should also not be considered as a simple consumable aboard a ship, and should during their service life continue to meet the original design philosophy. This will require ship operators to engage with manufacturers to confirm they have selected a line that will be fit for the intended purpose, and ensure that purpose is not compromised while in service.

Mooring lines – guidelines on inspection and/or maintenance of mooring lines

9 Mooring line failures are highlighted as a specific risk, and to prevent failure while a mooring line is in use, key information is required to be captured and maintained regarding a mooring line's usage history. Bearing in mind that collection of detailed information may be perceived as an additional administrative burden, OCIMF is of the view that recording mooring line usage data (e.g. line tension and hours in service) must be considered an integral part of the mooring system. In addition to tracking the service time, as with all items of equipment, it is important to monitor its condition to ensure the integrity of the mooring system. OCIMF is supportive of enhancements in the area of condition-based monitoring of all mooring lines whilst in service.

10 Guidelines on the routine inspection and/or maintenance of mooring lines should be a key aspect of the draft Guidelines and OCIMF encourages reference to specific manufacturers and industry guidance in the development of on-board procedures within the SMS as recommended in paragraph 38 of the Group's report. Procedures should consider the types of line in use (as requirements may differ), time in service, tension and loads (including peak loads) experienced, the operating environment, and any manufacturer's specific guidance.

Design of safe mooring arrangements – construction and equipment

11 OCIMF supports the draft Guidelines considering mooring equipment as a system rather than individual components. The mooring system should include consideration of mooring lines, winches, and fittings (chocks, bollards, bits, etc.). Section 5 of the draft Guidelines is beneficial, and will be a positive step forward for IMO to ensure the mooring system is treated like any other equipment aboard a ship and is considered holistically since the mooring system is interdependent on multiple components.

12 Accidents and incidents from mooring equipment can often be attributed to the design of complex mooring arrangements (e.g. raised trunk decks, external framing on tankers and limited visibility). These complex mooring arrangements can lead to issues such as a reduction in line MBL at pedestal and roller fairleads, reduced line of sight or workable deck space. OCIMF is of the view that more can be done to encourage the development of new technology in mooring, as well as the adoption of proven technologies such as load cell monitoring and CCTV where these can contribute to the overarching safety objectives, and the draft Guidelines are an opportunity to achieve this.

13 OCIMF notes that the functional objectives, as set out in section 4 of the draft Guidelines, advocate design considerations such as minimizing manual handling through use of automatic spooling winches. OCIMF is concerned by the ready availability of equipment to meet this need, and, as noted in paragraph 12 above, is of the view that to support this proposal technological development should be encouraged. The potential for unintended consequences of meeting this proposal will need to be considered, e.g. paragraph 5.1.5 of the draft Guidelines requires consideration of direct line leads, which may require ships to fit winches on both sides of the mooring deck at the ship's side. This would likely create a need for more winches and redundancy of winches unable to be utilized (e.g. quay side configuration optimization), all further crowding available deck space.

Design of safe mooring arrangements – operation

14 OCIMF broadly agrees with the general intent of the content of this section. Capturing the mooring arrangement plan, mooring system, and operations within the SMS system is a positive step forward that should be affirmed by IMO through the draft Guidelines. In addition, OCIMF is of the opinion that square brackets around paragraph 5.3.6 of the draft Guidelines should be removed as, notwithstanding other operational pressures or constraints, all personnel taking part in mooring operations should be familiar with ship specific systems.

Risk assessment

15 OCIMF fully supports the consideration of the mooring system early in the design phase of the ship, and further proposes that this should be the subject of an ongoing and enduring cradle to grave record to ensure the philosophies adopted at the design stage are maintained, and are subject to effective change management. To achieve both of these objectives, it is imperative that the mooring system and factors impacting it are fully considered through a formal safety assessment that is retained by the ship throughout its life.

16 OCIMF notes that the Correspondence Group has used as a reference the *Revised Guidelines for Formal Safety Assessment (FSA) for use in the IMO rule making process* (MSC-MEPC.2/Circ.12/Rev.1). OCIMF is broadly supportive of this as a reference point to aid clarification on risk assessment principles and process, but is keen to ensure there is no misunderstanding of the intent. Many stakeholders will have their own processes, and further the FSA Guidelines (MSC-MEPC.2/Circ.12/Rev.1) are primarily directed towards assessment of regulations. It is worth also noting that appendix 2 to the FSA Guidelines does not show mooring events in its examples of hazards. In supporting formal safety assessments, OCIMF is aware that various tools and methods may be deployed by different stakeholders in these processes. Paragraph 40.3 of the Group's report is, therefore, a key action of importance for the Sub-Committee to resolve.

17 OCIMF notes concerns over the use of principles such as ALARP and reference to the FSA Guidelines. OCIMF agrees that the optimal outcome of an effective risk assessment is to eliminate the risk of an incident to zero, but to achieve this absolute a new technology or best practice may require time to mature. In these situations an acceptance of ALARP should be considered, provided that in any associated cost-benefit analysis, commercial implications do not hold greater importance than the safety imperative.

18 The FSA Guidelines and, in particular, appendix 3, providing guidance regarding the variety of hazard identification and risk analysis techniques, are useful in the clarification of the considerations when reviewing human factors. Given the objective to consider a mooring equipment system holistically, it is anticipated that different techniques will be required at different stages of the assessment of the mooring system (e.g. FMEA and HAZOP). For this reason, OCIMF is of the opinion that the proposed section 6 of the draft Guidelines should focus on identifying preferred techniques for different system components, and on strengthening the reliability and consistency of outputs by formalizing the need for an independent assessment (particularly at the design phase), and the level of expertise for conducting a robust safety assessment.

19 Paragraph 6.3 of the draft Guidelines refers to "functional objectives reflected in section 5.4". As no such paragraph is found in the draft Guidelines, OCIMF is of the view that it should refer to section 4.

General comments on the action requested in paragraph 40 of the Group's report

20 OCIMF supports the Group's views on the following points:

- .1 More time is needed to further develop robust guidelines. However, OCIMF is keen to ensure this does not overly delay this important activity, and that positive action is taken to address this issue in new ships. OCIMF also encourages the application on existing ships as this will have an impact at the earliest opportunity, particularly regarding mooring line selection, identification, maintenance and usage guidelines.
- .2 Generic guidelines leveraging from industry best practice or incident reports could benefit the development of SMS. This could be further enhanced through reference to existing mature industry guidance (e.g. MEG), which would also help resolve concerns for the ship and terminal/shore interface noted in paragraph 30 of the Group's report.
- .3 Efficiency should be removed from draft Guidelines and emphasis given to "effective". Efficiency is often used in parallel with time/cost, with an inadvertent shift to speed of performing mooring operations, rather than reducing worker's exposure (e.g. reducing exposure during mooring operations using CCTV and remote controls).

- .4 Guidance on acceptable mooring arrangements are merited to achieve the functional requirements, and not to stifle further development of safe mooring designs.

Action requested of the Sub-Committee

- 21 The Sub-Committee is requested to consider the comments in paragraphs 5 to 20 above and take action as appropriate.
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