INTERNATIONAL MARITIME ORGANIZATION

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SUB-COMMITTEE ON CARRIAGE OF CARGOES AND CONTAINERS
10th session
Agenda item 7

CCC 10/7
5 June 2024
Original: ENGLISH
Pre-session public release: ☒

REVISION OF THE REVISED GUIDELINES FOR THE PREPARATION OF THE CARGO SECURING MANUAL (MSC.1/CIRC.1353/REV.2) TO INCLUDE HARMONIZED PERFORMANCE STANDARD FOR LASHING SOFTWARE TO PERMIT LASHING SOFTWARE AS A SUPPLEMENT TO THE CARGO SECURING MANUAL

Proposed revision of MSC.1/Circ.1353/Rev.2

Submitted by Germany and IACS

SUMMARY

Executive summary:	This document proposes a revision of MSC.1/Circ.1353/Rev.2 to accept lashing software as a supplement to the container stowage and securing arrangement plan included in the approved Cargo Securing Manual in order to evaluate actual loading conditions, and draft performance standards and guidelines with which the lashing software should comply to allow consistent approval of lashing software.
Strategic direction, if applicable:	7
Output:	7.40
Action to be taken:	Paragraph 10
Related documents:	CCC 8/12, CCC 8/18; MSC 107/17/6 and MSC 107/20

Background

1 The eighth session of the CCC Sub-Committee considered document CCC 8/12 (IACS), discussing the acceptance of lashing software as a supplement to the stowage and securing plan included in the approved Cargo Securing Manual (CSM), in order to evaluate actual loading conditions, and proposing a draft unified interpretation for endorsement by IMO. Having agreed that the proposal in document CCC 8/12 was beyond the remit of a unified interpretation, the Sub-Committee invited interested Member States and international organizations to submit proposals for a new output on lashing software as a supplement to the container stowage and securing plan (CCC 8/18, paragraphs 12.9 and 12.10).

2 Consequently, the 107th session of the Maritime Safety Committee considered document MSC 107/17/6 (France et al.), proposing a new output to revise the *Revised guidelines for the preparation of the Cargo Securing Manual* (MSC.1/Circ.1353/Rev.2),

to include performance standards for lashing software as a supplement to the container stowage and securing plan, and agreed to include in its post-biennial agenda an output on "Revision of the *Revised guidelines for the preparation of the Cargo Securing Manual* (MSC.1/Circ.1353/Rev.2) to include harmonized performance standard for lashing software to permit lashing software as a supplement to the Cargo Securing Manual", with two sessions needed to complete the item, assigning the CCC Sub-Committee as the associated organ (MSC 107/20, paragraphs 17.24 and 17.25).

Introduction

3 SOLAS regulation VI/5.6 states:

> "All cargoes, other than solid and liquid bulk cargoes, cargo units and cargo transport units shall be loaded, stowed and secured throughout the voyage in accordance with the Cargo Securing Manual approved by the Administration. In ships with ro-ro spaces, as defined in regulation II-2/3.41, all securing of such cargoes, cargo units and cargo transport units, in accordance with the Cargo Securing Manual, shall be completed before the ship leaves the berth. The Cargo Securing Manual shall be drawn up to a standard at least equivalent to relevant guidelines developed by the Organization."

4 Furthermore, the approved Cargo Securing Manual (CSM) should be drawn up in accordance with the recommendations contained in the *Revised guidelines for the preparation of the Cargo Securing Manual* contained in MSC.1/Circ.1353/Rev.2.

5 Paragraph 4.2.1 of chapter 4 of MSC.1/Circ.1353/Rev.2 contains provisions for stowage and securing plans, which should be implemented in the CSM, such as lashing pattern and sample container loading conditions. These sample loading conditions are normally prepared to illustrate the maximum loading capacity, based on a low metacentric height.

Discussion

6 As actual loading conditions of containerships can differ significantly due to the varying container carrying arrangements and weights from voyage to voyage, deviations from the sample loading conditions indicated in the approved stowage and securing plans can exist. Therefore, the evaluation of the actual loading conditions for compliance with container lashing rules by only using the stowage and securing plans in the approved CSM can be challenging without an automated means.

7 IACS notes that paragraph 3.2.5 of chapter 3 of MSC.1/Circ.1353/Rev.2 allows for a loading computer to be accepted as an alternative to documentation used to evaluate forces acting on non-standardized cargo units described in paragraphs 3.2.1 to 3.2.4 of MSC.1/Circ.1353/Rev.2, as follows:

> ".5 other operational arrangements such as electronic data processing (EDP) or use of a loading computer may be accepted as alternatives to the requirements of paragraphs 3.2.1 to 3.2.4 above, providing that this system contains the same information."

8 Considering paragraphs 6 and 7 above, and with the intent of providing a means to efficiently evaluate actual stowage and securing of cargo containers, IACS considers that a lashing software (currently available) can be used by the crew as a supplement to the approved stowage and securing plans included in the approved CSM (MSC.1/Circ.1353/Rev.2, chapter 4).

Proposal

9 IACS revised MSC.1/Circ.1353/Rev.2 to consider lashing software as a supplement to the CSM and developed draft performance standards and guidelines for application to containerships contracted for construction on or after 1 July 2025, which will allow the consistent approval of lashing software. Both proposals are contained in the annex of this document for consideration by the Sub-Committee. The proposed draft performance standards and guidelines originate from IACS unified requirement UR C6 on *Requirements for Lashing Software* which reflects the respective rules already applied by IACS members when approving and certifying lashing software.

Action requested of the Sub-Committee

10 The Sub-Committee is invited to consider the information provided in this document, the proposal in paragraph 9 and in the annex and take action, as appropriate.

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ANNEX

DRAFT REVISION OF MSC.1/CIRC.1353/REV.2

1 The operative paragraph 5 of the circular and paragraph 4.4 of the annex of the circular are proposed to be revised as follows*:

"5 Member Governments are invited to bring these Guidelines to the attention of all parties concerned, with the aim of having Cargo Securing Manuals carried on board ships prepared appropriately and in a consistent manner, and to:

.1 apply the Revised Guidelines in their entirety to containerships* the keels of which were laid or which were at a similar stage of construction on or after 1 January 2015; ~~and~~

.2 apply chapters 1 to 4 of the Revised Guidelines to existing containerships* the keels of which were laid or which were at a similar stage of construction before 1 January 2015; and~~.~~

.3 apply paragraph 4.4.3 of the Revised Guidelines to containerships contracted for construction on or after 1 July 2025 only."

"**4.4 Forces acting on cargo units**

4.4.1 This section should present the distribution of accelerations on which the stowage and securing system is based, and specify the underlying condition of stability. Information on forces induced by wind and sea on deck cargo should be provided.

4.4.2 It should further contain information on the nominal increase of forces or accelerations with an increase of initial stability. Recommendations should be given for reducing the risk of cargo losses from deck stowage by restrictions to stack masses or stack heights, where high initial stability cannot be avoided.

4.4.3 A lashing software should be used as a supplement to the requirements of paragraph 4.4.1 and 4.4.2, provided that this lashing software complies with the performance standards and guidelines in resolution A.714(17)."

2 The following new annex 15 is proposed to be added to the annex of resolution A.714(17):

"**ANNEX 15**

PERFORMANCE STANDARDS AND GUIDELINES FOR LASHING SOFTWARE

1 General

1.1 All seagoing dedicated containerships contracted for construction on or after 1 July 2025 should comply with these minimum requirements.

* Tracked changes are indicated using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text. The annex of the circular is the new text.

1.2 Lashing software is an electronic data processing tool for onboard analysis of forces in container stacks and thereby reflects the parameters of the lashing system as described in the Cargo Securing Manual prepared in accordance with requirements acceptable to the Administration.

1.3 An approved lashing software is not a substitute for the approved Cargo Securing Manual. It is considered as a supplement to the approved Cargo Securing Manual.

1.4 The lashing software is a ship-specific tool, and the results of the calculations are only applicable to the ship for which it has been approved.

2 Operation manual

2.1 An operation manual should be provided for the lashing software and be kept on board.

2.2 The language of the operation manual should be the same as the language of the approved Cargo Securing Manual. A translation into another language considered appropriate may be required.

2.3 The operation manual should contain descriptions and instructions, as appropriate, as per the following list:

.1 a general description of the lashing software;

.2 installation;

.3 function keys;

.4 menu displays;

.5 input and output data;

.6 required minimum hardware to operate the software;

.7 instruction on testing the lashing software with the test loading condition;

.8 a list of all terms, definitions, error messages and warnings likely to be encountered by the user; and

.9 in the case of error messages and warnings, there are to be unambiguous user instructions for subsequent action to be taken in each case.

3 Functional requirements

3.1 The lashing software should be capable of calculating forces on containers and container securing equipment for any loading conditions for each container stack.

3.2 It should also be capable of indicating the respective permissible values in order to assist the master in their judgement on whether the ship is loaded within the approved limits. The following parameters should be presented:

.1 summary of ship particulars, such as IMO No., length, and breadth;

.2 summary of loading conditions showing relevant input parameters, such as draught and GM;

.3 stack and container positions;

.4 actual stack weights verified against permissible stack weights;

.5 relevant properties of securing devices, including permissible loads;

.6 accelerations and other external forces, such as wind containers are exposed to; and

.7 listing of all calculated forces on containers and container securing equipment, and evaluation of compliance of the calculated forces with the corresponding allowable values.

3.3 The container and lashing arrangements in each bay on deck and in holds should be shown graphically.

3.4 The data should be presented on screen and in hard copy printout in a clear and unambiguous manner.

3.5 A clear warning should be given on screen and in hard copy printout if any of the allowable forces are exceeded.

3.6 In addition to the printout content, each page of the printout should contain ship's identification, lashing software name and version number, date and time of the printout, and the title of the loading condition. The printout should be paginated sequentially, and the total number of printout pages should be shown.

3.7 Units of measurement should be clearly identified and used consistently.

3.8 Incorrect data input by the users, such as negative draught values, should be prohibited. An error message is to be prompted on screen and in hard copy printout in a clear and unambiguous manner.

4 Test loading conditions

4.1 The lashing software should be delivered with test loading conditions for selected stacks and bays covering applicable stowage patterns for containers of different dimensions contained in the Cargo Securing Manual.

4.2 The test loading conditions and their results should be permanently stored in the computer where the lashing software is installed and be protected against unintentional or unauthorized modifications and access.

5 Approval of lashing software

5.1 The lashing software should be approved by the Administration or by the recognized organization on its behalf and should include:

.1 verification of type approval, if any;

.2 verification that the latest ship data has been used;

.3 verification and approval of the test loading conditions and their results;

.4 verification if requirements specified under functional requirements are satisfied;

.5 checking of proper installation, and verification of the instrument on board in accordance with the approved test loading conditions; and

.6 checking the availability of the operation manual on board.

5.2 In case of modifications implying changes in the ship's design or container securing arrangement, the software should be modified accordingly and re-approved by the Administration or by the recognized organization on its behalf.

5.3 Any changes in software version related to the container securing calculations should be reported to and should be approved by the Administration or by the recognized organization on its behalf.

5.4 Upon installation, the lashing software should be verified with the approved test loading conditions in the presence of the surveyor. It should be checked that the operation manual for the lashing software is available on board.

5.5 Verification by the Administration or by the recognized organization on its behalf does not absolve the shipowner of responsibility for ensuring that the information supplied into the lashing software is consistent with the current condition of the ship and approved Cargo Securing Manual.

6 Acceptable tolerances

6.1 The accuracy of the computational results from the lashing software for the particular ship, on which the lashing software will be installed, should be determined by using reference computation results deemed appropriate by the Administration or by the recognized organization acting on its behalf.

6.2 The tolerance of the accuracy of the results from the lashing software should be below 1.0% of the allowable values. However, deviations may be accepted subject to review by the Administration or by the recognized organization acting on its behalf provided that there is a satisfactory explanation for the deviation and that there will be no adverse effects on the safety of the ship.

7 Annual and special surveys

7.1 At each annual and special survey, it should be checked that the operation manual is available on board.

7.2 The lashing software should be checked for accuracy annually by the ship's master by applying the test loading conditions. If the surveyor is not present for lashing software check, a copy of the test loading condition results obtained by this check should be retained on board as documentation of satisfactory testing for the surveyor's verification at the next scheduled survey.

7.3 At each special survey, this checking should be done in the presence of the surveyor.

8 Other requirements

8.1 The lashing software and its data should be protected against unintentional or unauthorized modifications and access."