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GUIDELINES ON OPERATIONAL INFORMATION FOR MASTERS IN CASE OF FLOODING FOR PASSENGER SHIPS CONSTRUCTED BEFORE 1 JANUARY 2014*

1 The Maritime Safety Committee, at its ninety-ninth session (16 to 25 May 2018), having considered a proposal made by the Sub-Committee on Ship Design and Construction at its fifth session, approved the *Guidelines on operational information for masters in case of flooding for passenger ships constructed before 1 January 2014*, as set out in the annex, with a view to providing additional guidance for the uniform implementation of SOLAS regulation II-1/8-1.3, as amended by resolution MSC.436(99), for passenger ships constructed before 1 January 2014.

2 Member States are invited to apply the annexed Guidelines to passenger ships constructed before 1 January 2014; and bring them to the attention of owners and operators of passenger ships, and all other parties concerned.

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* In accordance with the decision of MSC 99 (MSC 99/22, paragraph 3.81.6), these Guidelines should be kept in abeyance until the date of entry into force of the amendments to SOLAS regulation II-1/8-1.3 adopted by resolution MSC.436(99), i.e. 1 January 2020.

ANNEX

GUIDELINES ON OPERATIONAL INFORMATION FOR MASTERS IN CASE OF FLOODING FOR PASSENGER SHIPS CONSTRUCTED BEFORE 1 JANUARY 2014

General

1 When an onboard stability computer is provided in accordance with SOLAS regulation II-1/8-1.3.1.1, the system referred to in these Guidelines should comprise an onboard stability computer capable of receiving and processing data to provide the master with regularly updated operational information on the residual damage stability of the ship after a flooding casualty.

2 When shore-based support is provided in accordance with SOLAS regulation II-1/8-1.3.1.2, the system referred to in these Guidelines should comprise two-way communication links to the shore-based support with a stability computer capable of receiving and processing data to provide the master with regularly updated operational information on the residual damage stability of the ship after a flooding casualty.

3 Stability computer software should use an accurate and detailed computer model of the entire hull, the pre-damage loading condition and the status of the watertight doors to calculate the residual damage stability following any flooding casualty by processing data to provide operational information required by the master.

System overview

4 At least two independent stability computers should be available at all times (either two on board, or two through shore-based support, or one of each), which are capable of receiving and processing the data necessary to provide operational information to the master.

5 The onboard system should have an uninterruptible power supply (UPS) connected to both the main and the emergency switchboards.

Input

6 The system should be pre-loaded with a detailed computer model of the complete hull including:

.1 appendages, compartments, tanks and the relevant parts of the superstructure considered in the damage stability calculation;

.2 wind profile;

.3 openings generating progressive flooding;

.4 internal compartment connections;

.5 cross-flooding arrangements; and

.6 escape routes or margin line (where applicable).

Each internal space should be assigned the same permeability used in the approved damage stability calculations, unless a more accurate permeability has been calculated.

7 The system should utilize the latest approved lightship weight and centre of gravity information.

8 Details of the damage location(s) and extent(s) or the damaged compartments should be input manually and combined with data from electronic sensors such as draught gauges, tank level devices, watertight door indicators and flooding level sensors, when available.

9 When electronic sensors providing direct data inputs are fitted, if it is considered at any time that a sensor or sensors are faulty, or have been damaged, it should be possible to override the sensor data with manually input data. The system should clearly indicate to its operator if a sensor that should be available is being manually overridden.

10 The system should be updated with the loading condition before the voyage commences and on a daily basis during navigation.

Calculation methods

11 The system should:

.1 utilize software capable of analysing the damage stability following any real flooding casualty including multi-compartment, non-linked breaches (see also paragraph 3 above);

.2 use the actual pre-damage loading condition;

.3 be capable of accounting for applied moments such as wind, lifeboat launching, cargo shifts and passenger relocation;

.4 account for the effect of wind by using the method in SOLAS regulation II-1/7-2.4.1.2 as the default, but allow for manual input of the wind speed/pressure if the on-scene pressure is significantly different ($P = 120\ N/m^2$ equates to Beaufort 6, i.e. approximately 13.8 m/s or 27 knots);

.5 be capable of assessing the impact of open watertight doors on stability; and

.6 have the capability of using the same detailed hull model for damage control drills or to assess potential damage and stability scenarios during a flooding casualty. This should not interfere with the ability of the onboard computer or shore-based support to monitor the actual situation and provide operational information to the master.

Output

12 The system should output the residual GZ curve both graphically and numerically. It should also provide the following information:

.1 draughts (forward, amidships and aft);

.2 trim;

.3 heel angle;

.4 GZ_{max};

.5 GZ range;

.6 angle of vanishing stability;

.7 down-flooding immersion angles; and

.8 immersion angles of escape routes or margin line (where applicable).

13 The output format and units of the information supplied to the operators of the system should be consistent with the format and units of the approved stability booklet in order to facilitate easy comparison. The output should be within the tolerances specified in the *Guidelines for the approval of stability instruments* (MSC.1/Circ.1229). Deviation from these tolerances should not be accepted unless there is an explanation satisfactory to the Administration.

14 The system should show a profile view, deck views and cross-sections of the ship indicating the flooded water-plane and the damaged compartments.

Other issues

15 An operation manual should be provided for the system software, printed in a language in which the operators of the system are fully conversant. The manual should also indicate the limitations of the system.

16 At least two crew members should be competent in the operation of the system including the communication links to the shore-based support, when provided. They should be capable of interpreting the output of the system in order to provide the required operational information to the master.

17 When shore-based support is provided in accordance with SOLAS regulation II-1/8-1.3.1.2:

.1 there should be a contract for the supply of shore-based support at all times during the validity of the Passenger Ship Safety Certificate;

.2 the shore-based support should be manned by adequately qualified persons with regard to stability, i.e. no less than two qualified persons should be available to be on call at all times; and

.3 the shore-based support should be operational within one hour (i.e. with the ability to input details of the condition of the ship, as instructed).

Ro-ro passenger ships

18 If applicable, there should be algorithms in the software for estimating the effect of water accumulation on deck.

Approval and testing

19 The stability aspects of the system should be initially approved and periodically checked against validated test conditions based on a number of loading/damage scenarios from the approved stability information book to ensure that it is operating correctly and that the stored data has not been subject to unauthorized alteration.

Limitations of the system

20 The system is not intended to compute transient asymmetrical flooding whereby the ship could capsize under the immediate inrush of floodwater before there is time for equalization measures to take effect.

21 The system is not intended to make any allowance for the motion of the ship in a seaway, including the effects of tide, current or wave action.

Equivalence

22 Equivalent arrangements to the provisions in these Guidelines may be employed to the satisfaction of the Administration.

Ships fitted with onboard damage stability computers before required by SOLAS regulation II-1/8-1.3

23 The Administration should be advised by the company, as defined in SOLAS regulation IX/1.2, of any ships fitted with systems before they are required by SOLAS regulation II-1/8-1.3, which may not fully comply with these Guidelines, to allow for a decision to be made on what further action, if any, is necessary. As a minimum, the system should have the functionality described under "Calculation methods" (see paragraph 11), "Output" (see paragraphs 12 to 14) and, if applicable, "Ro-ro passenger ships" (see paragraph 18).