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# **GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS**

**Part U**

**Intact Stability**

**GUIDANCE**

**2019 AMENDMENT NO.2**

Notice No.70      27 December 2019

Resolved by Technical Committee on 22 July 2019

AMENDMENT TO THE GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

“Guidance for the survey and construction of steel ships” has been partly amended as follows:

**Part U INTACT STABILITY**

**Amendment 2-1**

**U2 STABILITY REQUIREMENTS**

**U2.1 General**

**U2.1.1 General**

Sub-paragraph -4 has been added as follows.

**1** With respect to preparing the stability curves and heeling moment curves specified in **2.1.1-1, Chapter 2, Part U of the Rules**, the effects of changes in trim during heeling are to be taken into account.

**2** In addition to the loading conditions expected throughout the duration of the voyage, all designed loading conditions specified in **2.1.1-1, Chapter 2, Part U of the Rules** are to contain the standard loading condition described in **Annex U1.2.1 “GUIDANCE FOR STABILITY INFORMATION FOR MASTER”** or another standard loading condition deemed by the Society to be equivalent.

**3** For all loading conditions throughout the duration of the voyage, stability is to comply with **2.2 and 2.3, Chapter 2, Part U of the Rules**. For the conditions other than those during voyage (for example, during cargo loading),  $G_0M$  is to be always kept positive.

**4** Notwithstanding the provisions of the preceding -3, stability for liquefied gas carriers in all seagoing conditions and during loading and unloading cargo, including partial filling and loading and unloading at sea, is to comply with 2.2 and 2.3, Chapter 2, Part U of the Rules.

EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

1. The effective date of the amendments is 27 December 2019.

## Annex U1.2.1 GUIDANCE FOR STABILITY INFORMATION FOR MASTER

### 1.3 The Details of Each Content

Paragraph 1.3.10 has been amended as follows.

#### 1.3.10 General Data

**1** As a general data, various data stated in following ~~-2 to -813~~ -2 to -7 for tankers, ships carrying liquefied gases in bulk and ships carrying dangerous chemicals in bulk are to be presented in numerical tables or curves to give required values with sufficient accuracy. If any change in trim has a large effect on the values of various data, additional tables or curves for suitable range of trim is to be prepared or the method of correction to cope with the change in trim is to be given. With respect to hydrostatic curves or tables and cross curves of stability, each displacement and the effects of changes in trim during heeling are to be taken into account.

(-2 to -7 are omitted.)

**8** Maximum permissible height of centre of gravity, etc.

The diagram by which the master is able to confirm easily that the stability of his ship complies with the requirements in **1.3.8** in any loading condition, given in the functions and format deemed adequate by the Society taking ship type and service area into account are to be supplied.

For an example, it is to be of the curve of minimum permissible  $G_0M$  (or maximum permissible  $KG_0$ ) and maximum permissible trim in which draught and  $G_0M$  (or  $KG_0$ ) are respectively used as ordinate and abscissa. ~~Where the minimum permissible  $G_0M$  (or maximum permissible  $KG_0$ ) is determined from considerations related to the requirements in Chapter 4, Part C of the Rules, the minimum permissible  $G_0M$  between the deepest subdivision draught and the partial subdivision draught and between the partial subdivision draught and light service draught is to be linearly varied respectively and, for intermediate draughts, values to be used is to be obtained by linear interpolation applied to such  $G_0M$  value. Where the subdivision index is calculated for different trims, the minimum permissible  $G_0M$  (or maximum permissible  $KG_0$ ) curves are to be established in the same way.~~

**9** ~~Influence of Trims~~

~~The stability information is to show the influence of various trims in cases where the operational trim range exceeds  $\pm 0.5\%$  of  $L_s$  specified in 4.1.2(6) Part C of the Rules. The intact and damage stability information are to be presented as consolidated data and encompass the full operating range of draught and trim. Applied trim values are to coincide in all stability information intended for use on board. Information not required for determination of stability and trim limits is to be excluded from this information.~~

**10** If the damage stability is calculated in accordance with the requirements specified in **Chapter 4, Part C of the Rules** or **C6.1.1-3(1)**, a stability limit curve is to be determined using linear interpolation between the minimum required  $G_0M$  assumed for each of the three draughts  $d_s$ ,  $d_p$  and  $d_l$ . When additional subdivision indices are calculated for different trims, a single envelope curve based on the minimum values from these calculations is to be presented. When it is intended to develop curves of maximum permissible  $KG_0$  it is to be ensured that the resulting maximum  $KG_0$  curves correspond with a linear variation of  $G_0M$ .

**11** As an alternative to the single envelope curve specified in **-10** above, the calculations for additional trims may be carried out with one common  $G_0M$  for all of the trims assumed at each subdivision draught. The lowest values of each partial index  $A_s$ ,  $A_p$  and  $A_l$  across these trims are

then to be used in the summation of the attained subdivision index  $A$  according to the requirements specified in **Chapter 4, Part C of the Rules**. This will result in one  $G_0M$  limit curve based on the  $G_0M$  used at each draught. A trim limit diagram showing the assumed trim range is to be developed.

**12** Where temporary loading conditions occur with a draught less than the light service draught  $d_l$  due to ballast water exchange requirements, etc., the  $G_0M$  limit value at  $d_l$  is to be used for draughts below  $d_l$ .

**13** Where ships are permitted to sail at draughts above the deepest subdivision draught  $d_s$ , e.g. using the tropical freeboard, the  $G_0M$  limit value at  $d_s$  is to be used for draughts above  $d_s$ .

#### EFFECTIVE DATE AND APPLICATION (Amendment 2-2)

1. The effective date of the amendments is 1 January 2020.
2. Notwithstanding the amendments to the Guidance, the current requirements apply to ships other than ships that fall under the following:
  - (1) for which the contract for construction is placed on or after the effective date; or
  - (2) in the absence of a contract for construction, the keels of which are laid or which are at *a similar stage of construction* on or after 1 July 2020; or
  - (3) the delivery of which is on or after 1 January 2024.(Note) The term “*a similar stage of construction*” means the stage at which the construction identifiable with a specific ship begins and the assembly of that ship has commenced comprising at least 50 tonnes or 1% of the estimated mass of all structural material, whichever is the less.

Appendix U1 has been deleted.

## ~~Appendix U1 BOLLARD PULL TESTING PROCEDURE~~

### ~~(APPENDIX A to MSC/Circ.884 "GUIDELINES FOR SAFE OCEAN TOWING")~~

- ~~1 A proposed test programme should be submitted prior to the testing.~~
- ~~2 During testing of continuous bollard pull (BP) the main engine(s) should be run at the manufacturer's recommended maximum torque according to maximum continuous rating. Verification of the actual output should be requested during the test.~~
- ~~3 During testing of overload pull, the main engine(s) should be run at the manufacturer's recommended maximum rating that can be maintained for minimum 30 minutes.~~  
~~The overload test may be omitted.~~
- ~~4 The propeller(s) fitted when performing the test should be the propeller(s) used when the vessel is in normal operation.~~
- ~~5 All auxiliary equipment such as pumps, generators and other equipment which are driven from the main engine(s) or propeller shaft(s) in normal operation of the vessel should be connected during the test.~~
- ~~6 The length of the towline should not be less than 300 metres, measured between the stern of the vessel and the test bollard. A minimum length of twice the vessel length might be accepted.~~
- ~~7 The water depth at the test location should not be less than 20 metres within a radius of 100 metres of the vessel. If the water depth of 20 metres cannot be obtained at the test location, then a minimum water depth which is equal to twice the maximum draft of the vessel may be accepted. It should be noted that reduced water depth may adversely affect the test results.~~
- ~~8 The test should be carried out with the vessel's displacement corresponding to full ballast and half fuel capacity.~~
- ~~9 The vessel should be trimmed at even keel or at a trim by stern not exceeding 2% of the vessel's length.~~
- ~~10 The vessel should be able to maintain a fixed course for not less than 10 minutes while pulling as specified in items 2. or 3. above. Certified continuous bollard pull is the average reading of the 10 minutes period.~~
- ~~11 The test should be performed with a wind speed not exceeding 5 m/sec.~~
- ~~12 The current at the test location should not exceed 0.5 m/sec. in any direction.~~
- ~~13 The load cell used for the test should be approved by a competent body and be accurate within +/- 2% within the range of loads to be measured and for the environmental conditions experienced during the test.~~
- ~~14 An instrument giving a continuous read-out and also a recording instrument recording the bollard pull graphically as a function of time should both be connected to the load cell. The instruments should if possible be placed and monitored ashore.~~
- ~~15 The load cell should be fitted between the eye of the towline and the bollard.~~
- ~~16 The figure certified as the vessel's continuous bollard pull shall be the towing force recorded as being maintained without any tendency to decline for a duration of not less than 10 minutes.~~
- ~~17 Certification of bollard pull figures recorded when running the engine(s) at overload, reduced RPM or with a reduced number of main engines or propellers operating can be given and noted on the certificate.~~

~~18 A communication system shall be established between the vessel and the person(s) monitoring the load cell and the recording instrument ashore, by means of VHF or telephone connection, for the duration of the test.~~

#### EFFECTIVE DATE AND APPLICATION(Amendment 2-3)

1. The effective date of the amendments is 1 January 2020.
2. Notwithstanding the amendments to the Guidance, the current requirements apply to ships the keels of which were laid or which were at *a similar stage of construction* before the effective date.

(Note) The term “*a similar stage of construction*” means the stage at which the construction identifiable with a specific ship begins and the assembly of that ship has commenced comprising at least 50 tonnes or 1%\* of the estimated mass of all structural material, whichever is the less.

\* For high speed craft, “1%” is to be read as “3%”.