

Amendment to Stability/Loading Information in Conjunction with Alterations of Lightweight

Amended Rules and Guidance

Rules for the Survey and Construction of Steel Ships Part B
Rules for High Speed Craft
Rules for the Survey and Construction of Passenger Ships
Rules for the Survey and Construction of Inland Waterway Ships
Guidance for the Survey and Construction of Steel Ships Parts B, and V
Guidance for High Speed Craft
Guidance for the Survey and Construction of Passenger Ships
Guidance for the Survey and Construction of Inland Waterway Ships

Reason for Amendment

SOLAS Regulations II-1/5.4 and 5.5 specify criteria for assessing the need for the amendment to stability information as well as the need for re-inclining tests in cases where ships undergo alterations. These requirements have been already incorporated into the rules.

As environmental regulations such as MARPOL have become increasingly more restrictive over time, the number of ships undergoing major alterations to accommodate the installation of the SOx scrubbers and the ballast water treatment systems etc. to comply with such regulations has also been increasing and is expected to continue increasing for the foreseeable future. Such major alterations often also lead to corresponding changes in ship lightweight and, thus, may impact ship stability and loading calculations.

It is, however, unclear under current SOLAS regulations how to consider the impact of such alterations because there are no detailed procedures for amending stability information and loading manuals currently specified by SOLAS. To address this issue, IACS decided to discuss the development of a unified interpretation (UI) to specify detailed procedures for determining the need for lightweight calculations and amending stability information in the case of alterations of ships. IACS developed a draft UI to clarify matter and submitted to the IMO Subcommittee on Ship Design and Construction (SDC) for review.

The draft UI was agreed upon by the SDC at its 8th session (SDC 8) in January 2022. It was then sent on to the IMO Maritime Safety Committee (MSC) at its 105th session in May 2022, where it received final approval and was published as the MSC circular MSC.1/Circ.1362/Rev.1.

In addition to the above-mentioned UI, IACS also developed its own UI related to the deduction of superstructures and trunks for type B ships. IACS adopted this new UI LL81 in May 2022.

Accordingly, relevant rules and guidance are amended to incorporate IMO MSC.1/Circ.1362/Rev.1 and IACS UI LL81.

Outline of Amendment

- (1) Amends relevant requirements to specify lightweight calculation procedures for determining the need for amending stability information and the detailed procedure for doing so when needed.
- (2) Clarifies that IACS UI LL81 is applied when designating freeboards.

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

Part B CLASS SURVEYS

Chapter 1 GENERAL

1.4 Preparation for Survey and Other Items

1.4.5 Procedure for Tests, Wear and Tear, etc.

Sub-paragraph -2 has been amended as follows.

2 Inclining Test

~~An Inclining test is to be carried out at the Class Maintenance Survey, w~~Where alterations or repairs which might greatly affect the ship’s stability have been made and/or the Surveyor deems it necessary, 2.5.1-2 is to be followed to determine the need for re-inclining tests, and the need for amending stability information.

Chapter 2 CLASSIFICATION SURVEYS

2.5 Alterations

Paragraph 2.5.1 has been amended as follows.

2.5.1 Examinations of Altered Parts*

1 In cases where ships classified by the Society undergo repairs, alternations, modifications and outfitting related thereto (hereinafter referred to as “modifications, etc.”), such ships are to continue to at least comply with any previously applicable requirements. Moreover, such ships, if constructed before the date on which any relevant amendments enter into force, are, as a rule, to comply with any requirements for ships constructed on or after that date to at least the same extent as they did before undergoing such modifications, etc. The modification, etc. of any main particulars are to satisfy the requirements for ships constructed on or after the date on which any relevant amendments enter into force. In cases where ships undergo modifications, etc. which affect main particulars, unless otherwise permitted by the Society, the concerned ship is to comply with requirements in force at the time of such modifications, etc.

2 Where ships undergo alterations or repairs that may affect their main ship particulars, Table B2.5.1-1, Part B of the Guidance is to be followed.

“Rules for high speed craft” has been partly amended as follows:

Part 2 CLASS SURVEYS

Chapter 1 GENERAL

1.2 Preparation for Surveys and Others

1.2.5 Procedure for Tests, Wear and Tear, etc.

Sub-paragraph -2 has been amended as follows.

2 Inclining Test

~~Inclining test is to be carried out, w~~Where alterations or repairs which might greatly affect craft’s stability have been made on the occasion of Periodical Surveys or Planned Machinery Surveys ~~Further, inclining test may be required~~ and where deemed necessary by the Surveyor at any survey, 2.5.1-2, Part B of the Rules for Survey and Construction of Steel Ships is to be followed to determine the need for re-inclining tests, and the need for amending stability information.

Part 8 BUOYANCY, STABILITY AND SUBDIVISION

Chapter 1 GENERAL

1.7 Inclining and Stability Information

Paragraph 1.7.3 has been amended as follows.

1.7.3 Amendments of Stability Information Booklet

Where any alterations are made to a craft so as to materially ~~to~~ affect ~~the~~its stability information supplied to the master, ~~amended stability information, which is to be approved by the Society, is to be provided on board. The craft are to be re-inclined as deemed necessary.~~ 2.5.1-2, Part B of the Rules for Survey and Construction of Steel Ships is to be followed to determine the need for re-inclining tests, and the need for amending stability information.

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

Part 2 CLASS SURVEY

Chapter 2 CLASSIFICATION SURVEYS

2.3 Sea Trials and Stability Experiments

Paragraph 2.3.2 has been amended as follows.

2.3.2 Stability Experiments

Stability experiments are to be carried out in accordance with the requirement of **2.3.2, Part B of the Rules for the Survey and Construction of Steel Ships**. Omission of such experiments is not allowed.

Part 4 SUBDIVISION AND STABILITY

Chapter 4 INTACT STABILITY

4.3 Stability Information

4.3.1 General*

Sub-paragraph -2 has been amended as follows.

2 Where any alternations are made to a ship so as to materially affect ~~the~~ its stability information ~~supplied to the master, amended stability information is to be provided. If necessary the ship is to be re-inclined. The ship is to be re-inclined if anticipated deviations exceed one of the values specified in 4.2.1 (2), Part 2.~~ 2.5.1-2, Part B of the Rules for Survey and Construction of Steel Ships is to be followed to determine the need for re-inclining tests, and the need for amending stability information.

“Rules for the survey and construction of inland waterway ships” has been partly amended as follows:

Part 2 CLASS SURVEYS

Chapter 1 GENERAL

1.4 Preparation for Surveys and Miscellaneous

1.4.5 Procedure for Tests, Wear and Tear, etc.

Sub-paragraph -1 has been amended as follows.

1 Inclining Test

~~An Inclining test is to be carried out at the Class Maintenance Survey, w~~Where alterations or repairs which might greatly affect the ship’s stability have been made and/or the Surveyor deems it necessary, **2.5.1-2, Part B of the Rules for Survey and Construction of Steel Ships** is to be followed to determine the need for re-inclining tests, and the need for amending stability information.

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

Part B CLASS SURVEYS

B1 GENERAL

B1.1 Surveys

B1.1.2 Class Maintenance Surveys

Sub-paragraph -1 has been amended as follows.

1 Modifications and changes that are subject to Occasional Surveys referred to in 1.1.2-2(3), Part B of the Rules are as specified in (1) through (5) below:

((1) to (3) are omitted.)

(4) Change in the loading manuals, the stability information and other similar documents
When a modification is intended that alters the principal data of the ship, following ~~(a) to (d)~~ **B2.5.1-7 to -9** apply.

~~(a) When the differences between the original values of lightweight and lightship centre of gravity and the values calculated after conversion exceed either of the following deviation limits, an inclining test is to be carried out. In addition, the loading manual and stability information are to be amended using the altered principal data of the ship and then be approved by the Society.~~

~~i) Lightweight: 2%~~

~~ii) Lightship longitudinal centre of gravity: 1% of length for freeboard (L_f), as applicable. For ships other than those of 500 gross tonnage and above engaged on international voyages, 1% of length of ship (L) can be applied.~~

~~iii) Lightship vertical centre of gravity: 1%~~

~~(b) When a ship does not exceed the deviation limits specified in (a) above, but exceeds either of the following deviation limits, the loading manual and stability information are to be amended using the altered principal data and then be approved by the Society.~~

~~i) Lightweight: 1%~~

~~ii) Lightship longitudinal centre of gravity: 0.5% of length for freeboard (L_f), as applicable. For ships other than those of 500 gross tonnage and above engaged on international voyages, 0.5% of length of ship (L) can be applied.~~

~~iii) Lightship vertical centre of gravity: 0.5%~~

~~(c) When multiple alterations are made to a ship in service over a period of time and each alteration is within the deviation limits specified in (a) and (b) above, the deviation limits specified in (a) and (b) above are also to be applied to the cumulative total changes to the principal data from the most recent inclining or lightweight measurement.~~

~~(d) When the differences in the original values for draught, still water bending moment and shear force and the values calculated after conversion exceed 2%, the loading manual and stability information are to be amended using the altered principal data of the ship and then be approved by the Society.~~

((5) is omitted.)

B2 CLASSIFICATION SURVEYS

B2.5 Alterations

Paragraph B2.5.1 has been amended as follows.

B2.5.1 Examination of Altered Parts

1 In applying ~~the requirements specified in 2.5.1-1, Part B of the Rules,~~ in the case of the “application of modification, etc. which affects a main particular of a ship” (hereinafter referred to as “application of major conversion”), the following are to apply, except in cases where specified by the Society or Administration:

- (1) A “Major Conversion”, for example, refers to (but is not limited to) the following cases:
 - (a) Alteration of the dimensions of a ship; for example, the lengthening of a ship by adding a new midbody.
 - (b) Change of ship type; for example, the conversion from tanker to bulk carrier.
 - (c) Modification of construction which affects necessary requirements related to ship subdivisions. For ships not falling under any of the following **i)** to **iii)**, with respect to Required Subdivision Index (*R*) and Attained Subdivision Index (*A*) that are specified in **4.2, Part C of the Rules**, it is demonstrated that the *A/R* ratio calculated for the ship after such a modification is not less than the *A/R* ratio calculated for the ship before the modification. However, in cases where the ship’s *A/R* ratio before modification is equal to or greater than 1, it is necessary that the ship’s *A/R* ratio after modification be equal to or greater than 1.
 - i)** Ships for which the building contract is placed on or after 1 January 2020
 - ii)** In the absence of a building contract, the keel of ships is laid or which are at a similar stage of construction on or after 1 July 2020
 - iii)** The delivery of ships is on or after 1 January 2024.

2 In applying ~~the requirements specified in 2.5.1-1, Part B of the Rules,~~ in cases where single hull oil tankers are converted to double hull oil tanker or bulk carriers, except where specified by the Society or Administration, in addition the above requirement -1, the following requirements are to be complied with:

- (1) With respect to the ~~requirements on~~ subdivision specified in **Chapter 4, Part C of the Rules**, the requirements in accordance with ship’s type after conversion are to be complied with.
- (2) With respect to ~~the requirements on~~ stability, the following requirements are to be complied with:
 - (a) In the case of a conversion to a double hull oil tanker, **3.2.2, Part 3 of Rules for Marine Pollution Prevention Systems** is to still be applied.
 - (b) In the case of a conversion to a bulk carrier, **(5)** is to be applied.
- (3) The requirements on protective coating in seawater ballast tank, etc. specified in **25.2.2-1, Part C of the Rules** are not required to be complied with, except in cases where the entire internal structure of the seawater ballast tank ~~are~~ is newly made. However, the requirements specified in **25.2.2-2, Part C of the Rules** are to be applied.
- (4) The requirements on towing and mooring equipment specified in **27.2, Part C of the Rules** are to be applied.
- (5) In the case of conversion to a bulk carrier, ~~the requirements specified in 31A and 34.2, Part C of the Rules~~ are to be applied. However, the requirements on permanent means of access are to comply with **(6)**.
- (6) The requirements on permanent means of access, except in the case of the addition of substantial

new structures, are not required to be complied with. The wording “addition of substantial new structures” refers to hull structures that are entirely renewed or augmented by new double bottom and/or double side construction (e.g., replacing the entire structure within cargo areas or adding a new double bottom and/or double side section to existing cargo areas). Additionally, an approved access manual is to be provided.

- (7) In the case of conversion to a bulk carrier, the requirements on dewatering arrangements and water level detection and alarm systems specified in **13.5.10 and 13.8.5, Part D of the Rules** are to be applied.
- (8) The requirements on navigation bridge visibility specified in **2.1, Part W of the Rules** are to be applied unless navigation bridge visibility at the ballast loading condition prior to the conversion is maintained after the conversion.
- (9) The requirements on fire protection, escape and fire fighting specified in **Part R of the Rules** may be applied only to those parts which are altered.
- (10) In the case of a conversion to a double hull oil tanker, the requirements related to assignment of freeboard specified in **2.2.1, Part V of the Rules** are to be applied when the parameters used to determine the minimum freeboard are different before and after conversion or when there is a decrease in magnitude of freeboard assigned after the conversion.
- (11) The requirements specified in **18.3, 19.2.3, Chapter 20, 23.1, 23.2, 23.4, 23.5, 23.6, 23.7, 27.1.7 and 34.1.1-1, Part C of the Rules** and **13.4 and 13.6, Part D of the Rules** are to be applied when structures or equipment are newly added, replaced or modified.

3 In applying ~~the requirements specified in 2.5.1-1, Part B of the Rules~~, “permitted by the Society” refers to those cases where the Society agrees that it is difficult to apply a new requirement, and the Administration agrees to waive the concerned requirement.

4 In applying ~~the requirements specified in 2.5.1-1, Part B of the Rules~~, the tightness of such boundaries ~~are~~ is to be verified by the tests stipulated in **Annex B2.1.5-1 “Testing Procedures of Watertight Compartments”** in cases where any modifications or repairs have been carried out which affects the tightness of the watertight boundary.

5 In applying **2.5.1-1, Part B of the Rules**, the astern response characteristics of ships considered by the Society to have undergone significant repairs which impact the response characteristics of their propulsion systems are to be verified after such repairs are carried out by correspondingly applying the requirements for the astern tests carried out at Classification Surveys during Construction (See **2.3.1, Part B of the Rules** and **B2.1.4**). The tests are to demonstrate the satisfactory operation of the equipment or system under realistic service conditions at least over the manoeuvring range of the propulsion plant, for both ahead and astern directions. Depending on the actual extent of the repair, the Society may accept a reduction of the test plan.

6 In applying ~~the provisions of 2.5.1-1, Part B of the Rules~~, for ships where selective catalytic reduction systems, exhaust gas cleaning systems or exhaust gas recirculation systems are newly installed, applicable surveys to the relevant systems are to be carried out in accordance with **2.1, Part B of the Rules**.

7 In applying **2.5.1-2, Part B of the Rules, Table B2.5.1-1** is to be followed to determine the need for re-inclining tests, and the need for amending stability information. For such purposes, the term “lightweight calculation”, “lightship properties” and “stability information” are defined as follows:

- (1) “Lightweight calculation” means a detailed calculation of weights added to, removed from, and relocated on a ship, resulting from all alterations to the ship since the date of the last approved inclining test to determine the adjusted lightship properties. The documented weights and their centres of gravity are to be verified on board or on site by the attending Society surveyor.
- (2) “Lightship properties” means weight and the centre of gravity of ships.
- (3) “Stability information” includes any document (whether on paper or electronic) or electronic

means of calculation of stability which includes lightship properties. This may include, but is not limited to, approved stability books, computer software for onboard calculations of stability, approved strength books and loading instruments.

Table B2.5.1-1

<u>Result of lightweight calculation</u>	<u>Need for inclining test</u>	<u>Need for an amendment to stability information</u>
<u>Lightweight change > 2 %</u>	<u>Yes</u>	<u>Yes, using new inclining test result</u>
<u>LCG change > 1 % of ship length for freeboard (L_f), either forward or aft (For ships other than those of 500 gross tonnage and above engaged on international voyages, 1 % of length of ship (L) can be applied.)</u>	<u>Yes</u>	<u>Yes, using new inclining test result</u>
<u>VCG change > 1 %</u>	<u>Yes</u>	<u>Yes, using new inclining test result</u>
<u>1 % < Lightweight change < 2 %</u>	<u>No</u>	<u>Yes, using the calculated lightweight</u>
<u>0.5 % of ship length for freeboard (L_f) < LCG change < 1 % of ship length for freeboard (L_f), either forward or aft (For ships other than those of 500 gross tonnage and above engaged on international voyages, 0.5 % of length of ship (L) can be applied.)</u>	<u>No</u>	<u>Yes, using the calculated lightweight</u>
<u>0.5 % < VCG change < 1 %</u>	<u>No</u>	<u>Yes, using the calculated lightweight</u>
<u>Lightweight change < 1 %</u>	<u>No</u>	<u>No</u>
<u>LCG change < 0.5 % of ship length for freeboard (L_f), either forward or aft (For ships other than those of 500 gross tonnage and above engaged on international voyages, 0.5 % of length of ship (L) can be applied.)</u>	<u>No</u>	<u>No</u>
<u>VCG change < 0.5 %</u>	<u>No</u>	<u>No</u>

(Notes)

- (1) Longitudinal centre of gravity is abbreviated as “LCG” and vertical centre of gravity is abbreviated as “VCG”.
- (2) When multiple alterations are made to a ship in service over a period of time and each alternation is within the deviation limits specified in the table above, the cumulative total changes to the principal data from the most recent inclining test or lightweight calculation are to be used.
- (3) Both upward and downward changes to the vertical centre of gravity are to be considered.
- (4) When the differences in the original values for draught, still water bending moment and shear force and the values calculated after conversion exceed 2 %, the stability information are to be amended using the altered principal data of the ship and then be approved by the Society.
- (5) Lightship properties are to be consistent in all documents which use them (e.g. loading manual, stability manual, computer data).
- (6) A change in lightweight will result in a change in deadweight unless there is an associated change in freeboard. The consequences of the change could have an impact on compliance with other regulations (e.g. MARPOL Annex VI).

8 In applying 2.5.1-2, Part B of the Rules, where the stability information has been amended in accordance with -7 to reflect the lightship properties derived from the lightweight calculation, it is to be approved by the Society and provided to the master with instruction that it is now to be used for all stability calculations.

9 In applying 2.5.1-2, Part B of the Rules, when neither an inclining test nor an amendment to stability information has been done in accordance with -7, which means that addition, removal or relocation of any weight results in lightship properties are within the tolerable limits specified in the

Table B2.5.1-1, the following (1) and (2) are to be followed:

- (1) a copy of the lightweight calculation report endorsed by the Society is to be provided on board for future reference with no further amendments required to the stability information; and
- (2) that deviation of lightship properties are, however, still to be noted in the stability information on board for reference and applied to all future references and stability/loading calculations.

Part V LOAD LINES

V2 ASSIGNMENT OF FREEBOARD AND MARKING OF LOAD LINES

V2.1 General

V2.1.1 General

Sub-paragraph -2 has been amended as follows.

2 When a freeboard is assigned to a ship under the instruction by the flag Administration according to the *International Convention of Load Lines, 1966* ~~(before the modification by the 1988 Protocol)~~ and the *Protocol of 1988 relating to the International Convention of Load Lines, 1966*, the following *IACS Unified Interpretations* are to apply.

LL2, LL15, LL16, LL17, LL18, LL24, LL25, LL26, LL27, LL28, LL29, LL30, LL31, LL33, LL34, LL35, LL37, LL38, LL39, LL41, LL42, LL43, LL48, LL53, LL54, LL56, LL57, LL59, LL63, LL65, LL69, LL72, LL81

“Guidance for high speed craft” has been partly amended as follows:

Part 2 CLASS SURVEYS

Chapter 2 CLASSIFICATION SURVEYS

2.5 Alterations

2.5.1 Requirements of Surveys

Sub-paragraph -3 has been amended as follows.

3 ~~The stability experiment may be dispensed with in accordance with 2.3.2, where available stability data are obtained from the stability experiments conducted before~~ after alterations, ~~or from other adequate means and a special approval is given by the Society.~~ **B2.5.1-7 to -9, Part B of the Guidance for Survey and Construction of Steel Ships** is to be followed to determine the need for re-inclining tests, and the need for amending stability information.

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

Part 2 CLASS SURVEY

Chapter 4 SPECIAL SURVEYS

4.2 Hull, Equipment and Fire Extinguishing Systems

4.2.1 Hull

Sub-paragraph -3 has been added as follows.

3 In applying 4.2.1(2), Part 2 of the Rules, for ships that have undergone major alternations so as to materially affect their main ship particulars, regardless of -2 above, the lightship properties (as specified in B2.5.1-7, Part B of the Guidance for Survey and Construction of Steel Ships) obtained from lightweight surveys are to be used for stability information thereafter, even when lightweight survey results do not exceed the deviation limits specified in 4.2.1(2), Part 2 of the Rules.

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

Part 2 CLASS SURVEYS

Chapter 1 GENERAL

1.1 Surveys

1.1.2 Class Maintenance Surveys

Sub-paragraph -1 has been amended as follows.

1 Modifications and changes that are subject to Occasional Surveys referred to in **1.1.2-2(3), Part 2 of the Rules** are as specified in (1) through (5) below:

((1) and (2) are omitted.)

(3) ~~Change in~~Amendment of the loading manuals, the stability information and other similar documents

~~When a modification is intended that alters the principal data of the ship, a new loading manual, stability information and other similar documents are to be prepared based on the new data and approved by the Society. When differences of light weight and lightship longitudinal centre of gravity from the original values to values calculated for after conversion exceed either of the following limits, an inclining test is to be carried out~~ **B2.5.1-7 to -9, Part B of the Guidance for Survey and Construction of Steel Ships** are to be followed to determine the need for re-inclining tests, and the need for amending stability information.

~~(a) Light weight: 2% of the original value or 2 tonnes, whichever is greater~~

~~(b) Lightship longitudinal centre of gravity: 1% of length of ship (L)~~

((4) and (5) are omitted.)