

**RULES
FOR THE CLASSIFICATION OF
SHIPS**

*Part 4 – STABILITY
January 2020*

*Amendments No. 2
January 2022*

CROATIAN REGISTER OF SHIPPING

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By the decision of the General Committee of Croatian Register of Shipping,

Amendments No. 2 to the
RULES FOR THE CLASSIFICATION OF SHIPS
Part 4 – STABILITY

have been adopted on 20th December 2021 and shall enter into force on 1st January 2022

INTRODUCTORY NOTES

These amendments shall be read together with the requirements in the Rules for the Classification of Ships, Part 4 – Stability, edition January 2020, as amended by Amendments No. 1, edition July 2021.

Table 1 contains review of amendments, where items changed or added in relating to previous edition are given, with short description of each modification or addition. All major changes throughout the text are shaded.

This Part of the Rules includes the requirements of the following international Organisations:

International Maritime Organization (IMO)

- Conventions:** International Convention for the Safety of Life at Sea 1974 (SOLAS 1974) and all subsequent amendments up to and including the 2017 amendments (MSC.421(98)), and Conference on Bulk Carriers 1997 amendments.
Protocol of 1988 relating to the International Convention for the Safety of Life at Sea 1974, as amended (SOLAS PROT 1988).
International Convention for the Prevention of Pollution from Ships 1973, as modified by the Protocol of 1978 thereto (MARPOL 73/78) and all subsequent amendments up to and including the 2015 amendments (MEPC.248(66)).
- Resolutions:** MEPC.117(52), MEPC.248(66), MSC.235(82), MSC.398(95), A.715(17), MSC.413(97), MSC.415(97), MSC.421(98), MSC.436(99), MSC.443(99), MSC.444(99)

International Association of Classification Societies (IACS)

- Unified Requirements (UR):** L2 (Rev.2, 2013), L5 (Rev.4, June 2020)
- Unified Interpretations** LL80, MPC11 (Corr. 1, 2021), SC161 (Rev. 1, 2008), SC280

TABLE 1 – REVIEW OF AMENDMENTS

This review comprises amendments in relation to the Rules for the Classification of Ships, Part 4 – Stability, edition January 2020, as amended by Amendments No. 1, edition July 2021.

<i>ITEM</i>	<i>DESCRIPTION OF THE AMENDMENTS</i>
SECTION 3 ADDITIONAL REQUIREMENTS FOR STABILITY	
Head 3.4	Sub-items 3.4.4.2, 3.4.4.6 and 3.4.4.7 have been amended in order to include provisions of IACS UI MC 11 (Rev. 2, corr. 1, June 2021)
Head 3.4	Corrected renumbering of of existing sub-item 3.4.4.7 to 3.4.4.8

PART 4

AMENDMENTS No. 2

3 ADDITIONAL REQUIREMENTS FOR STABILITY

■ **Head 3.4 STABILITY OF TANKERS, INCLUDING STAGES OF LIQUID TRANSFER OPERATIONS,** sub-item 3.4.4.2 has been amended and should be read as follows:

3.4.4.2 Every tanker is to comply with the following intact stability criteria for any operating draught **under the worst possible conditions of cargo and ballast loading, consistent with good operational practice**, including the intermediate stages of liquid transfer operations:

- .1 In port, the initial metacentric height MG is not to be less than 0.15 m. Positive intact stability is to extend from the initial equilibrium position at which GM is calculated over a range of at least 20° to port and to starboard.
- .2 All sea-going conditions shall fulfil the intact stability criteria set in Head 2.1 of this part of the *Rules*.

■ **Head 3.4 STABILITY OF TANKERS, INCLUDING STAGES OF LIQUID TRANSFER OPERATIONS,** sub-items 3.4.4.6 and 3.4.4.7 have been amended and should be read as follows:

3.4.4.6 As an alternative to the loading case described in previous item, an extensive analysis covering all possible combinations of cargo and ballast tank loading is to be carried out. For such extensive analysis conditions it is considered that:

- .1 Weight, centre of gravity co-ordinates and free surface moment for all tanks are to be according to the actual content considered in the calculations.
- .2 The extensive calculations are to be carried out in accordance with the following:
 - .2.1 The draughts are to be varied between light ballast and scantling draught.
 - .2.2 Consumables including but not restricted to fuel oil, diesel oil and fresh water corresponding to 97%, 50% and 10% content are to be considered.
 - .2.3 For each draught and variation of consumables, the available deadweight is to comprise ballast water and cargo, such that combinations between maximum ballast and minimum cargo and vice-versa, are covered. In all cases the number of ballast and cargo tanks loaded is to be chosen to reflect the worst combination of VCG and free surface effects. Operational limits on the number of tanks considered to be simultaneously slack and exclusion of specific tanks are not permitted. All ballast tanks are to have at least 1% content.
 - .2.4 Cargo densities between the lowest and highest intended to be carried are to be considered.
 - .2.5 Sufficient steps between all limits are to be examined to ensure that the worst conditions are identified. A minimum of 20 steps for the range of cargo and ballast content, between 1% and 99% of total capacity, are to be examined. More closely spaced steps near critical parts of the range may be necessary.

At every stage the criteria specified in 3.4.4.2.1 and 3.4.4.2.2 are to be met.

In applying θ_r in Head 2.1, which 3.4.4.2.2 is referred to, openings which “cannot be closed weathertight” include ventilators (complying with regulation 19(4) of the International Convention on Load Lines, 1966) that for operational reasons have to remain open to supply air to the engine room or emergency generator room (if the same is considered buoyant in the stability calculation or protecting openings leading below) for the effective operation of the ship.

3.4.4.7 If for the existing ship in service and combination carriers the intact stability criteria specified in 3.4.4.2 are not met through its design alone, the master is to be provided with clear written instructions, approved by the *Register*, covering the operational restrictions and methods necessary to ensure compliance with these criteria during liquid transfer operations. These instructions should be **readily understandable to the officer-in-charge of liquid transfer operations** and:

- .1 require **no extensive** mathematical calculations by the officer-in-charge;
- .2 indicate the maximum number of cargo and ballast tanks that may be slack under any possible condition of liquid transfer;
- .3 provide pre-planned sequences of cargo/ballast transfer operations. These sequences specifically indicate the cargo and ballast tanks that may be slack to satisfy the stability criteria under any specific condition of liquid transfer and possible range of cargo densities. The slack tanks may vary during stages of the liquid transfer operations and be of any combination provided they satisfy the stability criteria;
- .4 provide instructions for pre-planning other sequences of cargo/ballast transfer operations, including use of stability performance criteria in graphical or tabular form which enable comparisons of required and attained stability. These instructions for pre-planning other sequences, in relation to individual vessels, should take account of:
 - .4.1 the degree or criticality with respect to the number of tanks which can simultaneously have maximum free surface effects at any stage of liquid transfer operations;
 - .4.2 the means provided to the officer-in-charge to monitor and assess the effects on stability and hull strength throughout the transfer operations;
 - .4.3 the need to give sufficient warning of an impending critical condition by reference to suitable margins (and the rate and direction of change) of the appropriate stability and hull strength parameters. If appropriate, the instructions should include safe procedures for suspending transfer operations until a suitable plan of remedial action has been evaluated.

- .4.4 the use of on-line shipboard computer systems during all liquid transfer operations, processing cargo and ballast tank ullage data and cargo densities to continuously monitor the vessel's stability and hull strength and, when necessary, to provide effective warning of an impending critical situation, possibly automatic shut-down, and evaluation of possible remedial actions. The use of such systems is to be encouraged.
- .5 provide for corrective actions to be taken by the officer-in-charge in case of unexpected technical difficulties with the recommended pre-planned transfer operations and in case of emergency situations. A general reference to the vessel's shipboard oil pollution emergency plan may be included.
- .6 be prominently displayed:
 - .6.1 in the approval trim and stability booklet;
 - .6.2 at the cargo/ballast transfer control station;
 - .6.3 in any computer software by which stability calculations are performed;
 - .6.4 in any computer software by which hull strength is monitored or calculations performed.

■ **Head 3.4 STABILITY OF TANKERS, INCLUDING STAGES OF LIQUID TRANSFER OPERATIONS**, corrected renumbering of existing sub-item 3.4.4.7 to 3.4.4.8:

3.4.4.8 For double hull oil tankers of single cargo tank across design, see also the requirements for operating manual, set in sub-item 1.5.3.2.