RULES
FOR THE CLASSIFICATION OF SHIPS

Part 4 – STABILITY
January 2020

Amendments No. 1
July 2021

CROATIAN REGISTER OF SHIPPING

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

Amendments No. 1 to the
RULES FOR THE CLASSIFICATION OF SHIPS
Part 4 – STABILITY

have been adopted on 28th June 2021 and shall enter into force on 1st July 2021

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.

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 (Rev. 2, 2016), 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.

ITEM	*DESCRIPTION OF THE AMENDMENTS*
SECTION 1 GENERAL	
Head 1.1	Items 1.1.1 and 1.1.2 have been amended
SECTION 3 ADDITIONAL REQUIREMENTS FOR STABILITY	
Head 3.17	New item 3.17.8 has been added
APPENDIX 5 COMPUTER SOFTWARE FOR ONBOARD STABILITY CALCULATIONS	
Head 1.4	Sub-item 1.4.1.3 has been amended

1 GENERAL

■ **Head 1.1 APPLICATION,** items 1.1.1 and 1.1.2, have been changed and should be read as follows:

1.1.1 This part of the Rules for the classification of sea going ships (hereafter referred to as: the Rules) applies to all newbuildings of the decked ships navigating in displacement mode.

This part of the Rules also provides intact stability criteria applicable to the same ships and marine units when engaged in certain operations, such as: anchor handling, towing, escort towing, lifting operations or similar.

For ships of less than 24 m in length, requirements set in the *Rules for the classification of ships, Part 34 – Rules for the classification of vessels of less than 24 m in length, Section 9*, shall be applied.

1.1.2 This Part of the Rules applies to existing ships in service as far as it is reasonable and practicable, but it is, however, compulsory for ships which undergo: conversion, alteration or modification, major repair; replacement of engines, installations and equipment; and if their stability is impaired as a result.

Stability of ships under 24 m in length after reconstruction, major repair, alteration or modification; replacement of engines, installations and equipment; is to comply either with the requirements of this Part, Section 9 of the *Rules for the classification of ships, Part 34 – Rules for the classification of vessels of less than 24 m in length*, or with the requirements applied to such ships before reconstruction, major repair, alteration or modification.

3 ADDITIONAL REQUIREMENTS FOR STABILITY

■ **Head 3.17 COMMERCIAL YACHTS,** new item 3.17.8 has been added and should be read as follows:

3.17.8 Stability of the sailing yachts

3.17.8.1 The requirements set in this item shall be applied to all yachts under sails.

3.17.8.2 For single-hull yacht, the following criteria shall be applied:

.1 Area (B+C) below the curve of static stability (GZ) shall be at least 1.4 times greater than area (A+B) (see Figure 3.17-1);

.2 the maximum GZ lever shall be at least 0.3 m;

.3 the positive range of the curve of static stability (GZ) shall be at least: 90° - for yachts with dedicated ballast keel (protruding from the keel line of the main hull); and 60° - for other yachts;

.4 initial transversal metacentric height, GM_0, shall be at least 0.6 m; and

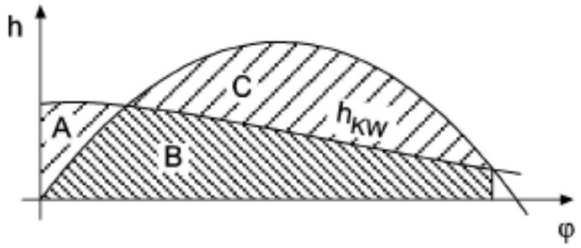
.5 static angle of heel of the yacht, while sailing, shall be up to the least of the following values:

a) angle of immersion of the deck edge,

b) angle of immersion of the lower edge of sidescuttles, if openable, or

c) 20°.

Fig. 3.17-1



$$(B+C) \geq 1.4 \cdot (A+B)$$

where:

h_{KW} - wind heeling lever, in m, due to wind action on the exposed area (including sails) of the yacht's lateral projection. It should be calculated as follows:

$$h_{KW} = \cos^2\varphi \cdot \frac{P \cdot A \cdot (z - H)}{1000 \cdot g \cdot \Delta}$$

where:

P - value of wind pressure, in Pa [N/m^2], that shall be taken in accordance with the yacht's navigation area;

A - projected lateral area of the particular sail configuration and the portion of the yacht above the waterline, in m^2;

z - height of the centre of A above the baseline, in m;

H - height of the centre of the underwater lateral area of the hull above the baseline, or, approximately, one half of the actual draught, in m;

g - 9.81 [m/s^2]; and

Δ - displacement of the yacht in actual load condition, in t.

Load conditions with the most unfavourable stability characteristics shall be included in stability analysis of the yacht under sails.

Full sails setting should be considered when calculating lateral area A in the formulae above. However, if the yacht fails to satisfy the criterion in 3.17.8.2.1 with all sails set and for the wind taken in accordance with its navigation area, it shall be determined both of the following:

- the permissible wind speed, or force, at which the limit of stability set by the criterion is reached for full set of sails; and
- the permissible set of sails for which the criterion is satisfied, with the wind force taken as required for the yacht's navigation area.

3.17.8.3 For multihull vessels, the criteria set in 3.17.8.2 shall be applied, with required positive range of the curve of static stability (GZ) of at least 60°.

Additionally, requirements for longitudinal stability will be set by the *Register*, on case-by-case basis.

3.17.8.4 Alternatively, the regulations set by the Administration may be used, if applied in their entirety (for example, MCA Large Yacht (LY3) Code).

APPENDIX 5
COMPUTER SOFTWARE FOR ONBOARD STABILITY CALCULATIONS

■ **Head 1.4 FUNCTIONAL REQUIREMENTS,** item 1.4.1.3 has been amended and should be read as follows:

1.4.1.3 Type 3 software is to include pre-defined relevant damage cases for both sides of the ship according to the applicable rules for automatic check of a given loading condition.