

Common Structural Rules for Bulk Carriers, January 2006

Background Document

CHAPTER 10 – HULL OUTFITTING

NOTE:

- This TB is published to improve the transparency of CSRs and increase the understanding of CSRs in the industry.
- The content of the TB is not to be considered as requirements.
- This TB cannot be used to avoid any requirements in CSRs, and in cases where this TB deviates from the Rules, the Rules have precedence.
- This TB provides the background for the first version (January 2006) of the CSRs, and is not subject to maintenance.

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SECTION 1 – RUDDER AND MANOEUVRING ARRANGEMENT

1. GENERAL

1.1 Manoeuvring arrangement

1.1.1

1.1.1.a These regulations are based on A1.1 and A1.2 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

1.1.2

1.1.2.a These regulations are based on A1.3 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

1.1.3

1.1.3.a These regulations are based on A1.4 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

1.2 Structural details

1.2.1

1.2.1.a This regulation is according to A.2.1, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on 1.2.1 of IACS UR S10.

1.2.2

1.2.2.a This regulation is according to A.2.2, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on 1.2.2 of IACS UR S10.

1.2.3

1.2.3.a This is a newly formulated regulation. Each classification society has its own rules related to continuity of structures. This regulation is considered on the lines of the rules of various classification societies.

1.2.4

1.2.4.a This regulation is according to A.2.3, Sec. 14, Chapter 1, Part 1 of the GL Rules, and is based on 1.2.3 of IACS UR S10. However, a special rudder (rudder trunk extends to the internal part of the hull, and forms a structure supporting the rudder stock) is assumed, and rudder trunk is required to be of watertight construction.

1.3 Size of rudder area

1.3.1

1.3.1.a This regulation is according to A.3 of Sec. 14, Chapter 1, Part 1 of the GL Rules. The standard area of rudder is given by parameters such as ship's length and draft. (Recommended items)

1.4 Material

1.4.1

1.4.1.a This regulation is self-explanatory and is based on S10.1.3.1 to S10.1.3.3 of IACS UR S10.

1.4.2

1.4.2.a This regulation is according to A.4.2 to A4.44, Sec. 14, Chapter 1, Part 1 of the GL Rules, and is based on S10.1.3.1 to S10.1.3.3 of IACS UR S10.

1.4.3

1.4.3.a This regulation is according to A.4.3 to A4.44, Sec. 14, Chapter 1, Part 1 of the GL Rules, and is based on S10.1.3.1 to S10.1.3.3 of IACS UR S10.

1.4.4

1.4.4.a This regulation is according to A4.4, Sec. 14, Chapter 1, Part 1 of the GL Rules, and is based on S10.1.3.1 to S10.1.3.3 of IACS UR S10.

2. RUDDER FORCE AND TORQUE

2.1 Rudder force and torque for normal rudders

2.1.1

2.1.1.a These regulations are according to B1.1 of Sec. 14, Chapter 1, Part 1 of the GL Rules, and are based on 2.1.1 of IACS UR S10. The balance ratio of an unbalanced rudder is taken at a uniform value of 0.08.

2.1.2

2.1.2.a These regulations are according to B1.2 of Sec. 14, Chapter 1, Part 1 of the GL Rules, and are based on 2.1.2 of IACS UR S10. The balance factor of an unbalanced rudder is taken at a uniform value of 0.08.

2.1.3

2.1.3.a This regulation is according to B.1.3 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

2.2 Rudder force and torque for rudder blades with cut-outs (semi-spade rudders)

2.2.1

2.2.1.a These regulations are according to B2.1 of Sec. 14, Chapter 1, Part 1 of the GL Rules, and are based on 2.2 of IACS UR S10.

2.2.2

2.2.2.a These regulations are according to B2.2 of Sec. 14, Chapter 1, Part 1 of the GL Rules, and are based on 2.2 of IACS UR S10.

2.2.3

- 2.2.3.a These regulations are according to B2.3 of Sec. 14, Chapter 1, Part 1 of the GL Rules, and are based on 2.2 of IACS UR S10.

3. SCANTLINGS OF THE RUDDER STOCK

3.1 Rudder stock diameter

3.1.1

- 3.1.1.a This regulation is according to C.1.1, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on 3. of IACS UR S10.

3.1.2

- 3.1.2.a This regulation is according to C.1.2, Sec. 14, Chapter 1, Part 1 of the GL Rules.

3.1.3

- 3.1.3.a This regulation is according to C.1.3 of Sec. 14, Chapter 1, Part 1, of the GL Rules.

3.1.4

- 3.1.4.a This regulation is according to C.1.4, Sec. 14, Chapter 1, Part 1 of the GL Rules.

3.2 Strengthening of rudder stock

3.2.1

- 3.2.1.a This regulation is according to C.2.1, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on 4.3 of IACS UR S10.

3.3 Analysis

3.3.1 General

- 3.3.1.a This regulation is according to C.3.1, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on IACS UR S10, and 1. of the Appendix. However, a simplified procedure has been added in addition to the rudder supported by the upper rudder stock and the lower pintle specified in IACS UR, spade rudders, and Mariner type rudder, Mariner type rudder in which the neck bearing is supported by the rudder horn and rudder trunk extends to the internal part of the rudder body, spade rudder with a construction that supports the rudder stock (can be observed in rudder with trunk) for the data for analysis specified after 3.3.2. In case of the former, Type 9 required in Sec. 1, Chapter 10, Part B of the BV Rules has been adopted. The latter however, does not exist in any rules and has been proposed a new by GL for CSR development. The calculations for these rudders will be according to the regulations of the each Society Rules

3.3.2 Data for the analysis

- 3.3.2.a This regulation is according to C.3.2, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on IACS UR S10, and 2. of the Appendix, but as mentioned above, a new regulation has been added. It is observed that the simplified procedure for spade rudders with a construction that supports the rudder stock and in which the rudder

trunk extends to the internal part of the rudder body, may not conform to the actual supporting structure of each rudder. Thus, correction is necessary depending on the actual application including correction to the structure.

3.3.3 Moments and forces to be evaluated

3.3.3.a This regulation is according to B.3.3, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on IACS UR S10, and 2. of the Appendix, but as mentioned above, a new regulation has been added. When the rudder trunk extends to the internal part of the rudder body, corrections are necessary as mentioned above to the structures before application.

3.4 Rudder trunk

3.4.1

3.4.1.a This regulation is according to B.4, Sec. 14, Chapter 1, Part 1 of the GL Rules and 5.6, Sec. 1, Chapter 10, Part B of the BV Rules. It corresponds to the regulation related to spade rudders where the rudder trunk extends to the internal part of the rudder body and the construction is such that it supports the rudder stock. It is specified as a requirement related to rudder trunk supporting the said rudder.

3.4.2

3.4.2.a This regulation is according to 5.6.1, Sec. 1, Chapter 10, Part B of the BV Rules.

3.4.3

3.4.3.a This regulation is according to 5.6.2, Sec. 1, Chapter 10, Part B of the BV Rules.

3.4.4

3.4.4.a This regulation is according to 5.6.3, Sec. 1, Chapter 10, Part B of the BV Rules.

3.4.5

3.4.5.a This regulation is according to 5.6.4, Sec. 1, Chapter 10, Part B of the BV Rules.

3.4.6

3.4.6.a This regulation is according to 5.6.4, Sec. 1, Chapter 10, Part B of the BV Rules.

3.4.7

3.4.7.a This regulation is according to 5.6.5, Sec. 1, Chapter 10, Part B of the BV Rules.

3.4.8

3.4.8.a This regulation is according to 5.6.6, Sec. 1, Chapter 10, Part B of the BV Rules.

4. RUDDER COUPLINGS

4.1 General

4.1.1

4.1.1.a This regulation is according to D.1.1 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

4.1.2

4.1.2.a This regulation is according to D.1.2 of Sec. 14, Chapter 1, Part 1 of the GL Rules. Actually, it is covered in the regulation of 4.2.

4.1.3

4.1.3.a This regulation is according to D.1.3, Sec. 14, Chapter 1, Part 1 of the GL Rules. It corresponds to the regulations of 3.7.1-1 and -3, 3.7.3-1 and -3. of Part C of the Rules for the Survey and Construction of Steel Ships.

4.1.4

4.1.4.a This regulation is according to D.1.4 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

4.2 Horizontal couplings

4.2.1

4.2.1.a This regulation is according to D.2.1, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on 6.1.1 of IACS UR S10..

4.2.2

4.2.2.a This regulation is according to D.2.2, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on 6.2.2 and 6.1.3 of IACS UR S10.

4.2.3

4.2.3.a These regulations are according to D.2.3 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

4.2.4

4.2.4.a These regulations are according to D.2.4 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

4.2.5

4.2.5.a These regulations are according to D.2.5 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

4.3 Vertical couplings

4.3.1

4.3.1.a This regulation is according to D.3.1, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on 6.3.1 of IACS UR S10.

4.3.2

4.3.2.a This regulation is according to D.3.2, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on 6.3.2 of IACS UR S10.

4.3.3

4.3.3.a This regulation is according to D.3.3, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on 6.3.3 of IACS UR S10.

4.4 Cone couplings with key

4.4.1

4.4.1.a These regulations are according to D4.1.1 of Sec. 14, Chapter 1, Part 1 of the GL Rules, and are based on IACS UR S10.6.2.1.

4.4.2

4.4.2.a These regulations are according to D4.1.2 of Sec. 14, Chapter 1, Part 1 of the GL Rules, and are based on IACS UR S10.6.2.1.

4.4.3

4.4.3.a This regulation is according to D.4.1.3 of Sec. 14, Chapter 1, Part 1 of the GL Rules. When incorporated in CSR, however, the required cross section area has been increased by about 10%.

4.4.4

4.4.4.a This regulation is according to D.4.1.4, Sec. 14, Chapter 1, Part 1 of the GL Rules.

4.4.5

4.4.5.a This regulation is according to D.4.1.5, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on 6.2.2 of IACS UR S5.10.

4.4.6

4.4.6.a This regulation is according to D.4.1.6 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

4.5 Cone couplings with special arrangements for mounting and dismounting the couplings

4.5.1

4.5.1.a This regulation is according to D.4.2.1, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on IACS UR S5.10.6.2.3.

4.5.2

4.5.2.a This regulation is according to D.4.2.2, Sec. 14, Chapter 1, Part 1 of the GL Rules.

4.5.3 Push-up pressure and push-up length

4.5.3.a These regulations are according to D.4.2.3 to D.4.2.4 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

4.5.4 Push-up pressure

4.5.4.a These regulations are according to D.4.2.3.1 to D.4.2.4 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

4.5.5 Push-up length

4.5.5.a These regulations are according to D.4.2.3.2 to D.4.2.4 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

4.5.6 Push-up pressure for pintle bearings

4.5.6.a These regulations are according to D.4.2.4 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

5. RUDDER BODY, RUDDER BEARINGS

5.1 Strength of rudder body

5.1.1

5.1.1.a This regulation is according to E.1.1, Sec. 14, Chapter 1, Part 1 of the GL Rules.

5.1.2

5.1.2.a This regulation is according to E.1.2 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

5.1.3

5.1.3.a These regulations are according to E.1.3, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on 5.1(a) of IACS UR S10. The permissible stress of a part of the regulations has been revised.

5.1.4

5.1.4.a These regulations are according to E.1.4, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on IACS 5.1(b) of UR S10. The permissible stress of a part of the regulations has been revised.

5.2 Rudder plating

5.2.1

5.2.1.a These regulations are according to E.2.1, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on the first half of the regulations in 5.2 of IACS UR S10.

5.2.2

5.2.2.a This regulation is according to E.2.2, Sec. 14, Chapter 1, Part 1 of the GL Rules.

5.2.3

5.2.3.a This regulation is according to E.2.3, Sec. 14, Chapter 1, Part 1 of the GL Rules, and is based on the second half of the regulations in 5.2 of IACS UR S10.

5.3 Connections of rudder blade structure with solid parts in forged or cast steel

5.3.1 General

5.3.1.a Regulations are according to E7.4.1, Sec. 1, Chapter 10, Part B of the BV Rules.

5.3.2 Minimum section modulus of the connection with the rudder stock housing

5.3.2.a Regulations are according to E7.4.2, Sec. 1, Chapter 10, Part B of the BV Rules.

5.3.3 Calculation of actual section modulus of the connection with the rudder stock housing

5.3.3.a Regulations are according to 7.4.3, Sec. 1, Chapter 10, Part 1 of the BV Rules.

5.3.4 Thickness of horizontal web plates

5.3.4.a Regulations are according to 7.4.4, Sec. 1, Chapter 10, Part 1 of the BV Rules.

5.3.5 Thickness of side plating and vertical web plates welded to the solid part

5.3.5.a Regulations are according to 7.4.5, Sec. 1, Chapter 10, Part 1 of the BV Rules.

5.3.6 Solid part protrusions

5.3.6.a Regulations are according to 7.4.6, Sec. 1, Chapter 10, Part 1 of the BV Rules.

5.3.7

5.3.7.a Regulations are according to E3.2, Sec. 14, Chapter 1, Part 1, of the GL Rules.

5.4 Rudder bearings

5.4.1

5.4.1.a This regulation is according to E.4.1 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

5.4.2

5.4.2.a This regulation is according to E.4.2 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

5.4.3

5.4.3.a This regulation is according to E.4.3, Sec. 14, Chapter 1, Part 1 of the GL Rules, and it is not specified clearly in IACS UR S10. The formula is merely a simplified formula for initial calculations, and is inappropriate for use in ultimate strength studies.

5.4.4

5.4.4.a This regulation is according to E.4.4, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on 8.1 of IACS UR S10.

5.4.5

5.4.5.a This regulation is according to E.4.5 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

5.4.6

5.4.6.a This regulation is according to E.4.6 and E4.7, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on 8.2 of IACS UR S10

5.5 Pintles

5.5.1

5.5.1.a This regulation is according to E.5.1, Sec. 14, Chapter 1, Part 1 of the GL Rules, and is based on the second half of the regulations in 7.1 of IACS UR S10.

5.5.2

5.5.2.a This regulation is according to E.5.2 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

5.5.3

5.5.3.a This regulation is according to E.5.3, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on the description in the first half of the regulation in 7.1 of IACS UR S10.

5.5.4

5.5.4.a This regulation is according to E.5.4, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on 7.2 of IACS UR S10.

5.6 Criteria for bearing clearance

5.6.1

5.6.1.a This regulation is according to E.6.1, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on 8.3 of IACS UR S10.

5.6.2

5.6.2.a This regulation is according to E.6.2, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on 8.3 of IACS UR S10.

5.6.3

5.6.3.a This regulation is according to E.6.3, Sec. 14, Chapter 1, Part 1 of the GL Rules, and based on 8.3 of IACS UR S10.

6. DESIGN YIELD MOMENT OF RUDDER STOCK

6.1 General

6.1.1

6.1.1.a This regulation is according to F of Sec. 14, Chapter 1, Part 1 of the GL Rules.

7. STOPPER, LOCKING DEVICE

7.1 Stopper

7.1.1

7.1.1.a This regulation is according to G.1, Sec. 14, Chapter 1, Part 1 of the GL Rules.

7.2 Locking device

7.2.1

7.2.1.a This regulation is according to G.2, Sec. 14, Chapter 1, Part 1 of the GL Rules. Detailed strength requirements are specified in this requirement.

7.3

7.3.1

7.3.1.a This regulation is according to G.3 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

8. PROPELLER NOZZLES

8.1 General

8.1.1

8.1.1.a This regulation is according to H.1.1 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

8.1.2

8.1.2.a This regulation is according to H.1.2 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

8.2 Design pressure

8.2.1

8.2.1.a This regulation is according to H.2 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

8.3 Plate thickness

8.3.1

8.3.1.a This regulation is according to H.3.1 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

8.3.2

8.3.2.a This regulation is according to H.3.2 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

8.4 Section modulus

8.4.1

8.4.1.a This regulation is according to H.4 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

8.5 Welding

8.5.1

8.5.1.a This regulation is according to H.5 of Sec. 14, Chapter 1, Part 1 of the GL Rules.

9. RUDDER HORN AND SOLE PIECE SCANTLINGS

9.1 Sole piece

9.1.1

9.1.1.a This regulation is according to C.4.1, Sec. 13, Chapter 1, Part 1 of the GL Rules, and based on 9.1 of IACS UR S10.

9.1.2

9.1.2.a This regulation is according to C.4.3, Sec. 13, Chapter 1, Part 1 of the GL Rules, and based on IACS UR S10.9.1.

9.1.3

9.1.3.a This regulation is according to C.4.4, Sec. 13, Chapter 1, Part 1 of the GL Rules, and based on IACS UR S10.9.1.

9.1.4

9.1.4.a This regulation is according to C.4.5, Sec. 13, Chapter 1, Part 1 of the GL Rules, and based on IACS UR S10.9.1.

9.2 Rudder horn of semi spade rudders (case of 1-elastic support)

9.2.1

9.2.1.a This regulation is according to C.5.1, Sec. 13, Chapter 1, Part 1 of the GL Rules, and based on 9.2 of IACS UR S10.

9.2.2

9.2.2.a This regulation is according to C.5.2, Sec. 13, Chapter 1, Part 1 of the GL Rules, and based on 9.2 of IACS UR S10.

9.2.3

9.2.3.a This regulation is according to C.5.3, Sec. 13, Chapter 1, Part 1 of the GL Rules, and based on 9.2 of IACS UR S10.

9.2.4

9.2.4.a This regulation is according to C.5.4, Sec. 13, Chapter 1, Part 1 of the GL Rules, and based on 9.2.1 of IACS UR S10.

9.2.5

9.2.5.a This regulation is according to C.5.5 of Sec. 13, Chapter 1, Part 1, of the GL Rules.

9.2.6

9.2.6.a These regulations are according to C.5.6, Sec. 13, Chapter 1, Part 1 of the GL Rules

9.2.7

9.2.7.a These regulations are according to C.5.7, Sec. 13, Chapter 1, Part 1 of the GL Rules

9.2.8

9.2.8.a These regulations are according to C.5.8, Sec. 13, Chapter 1, Part 1 of the GL Rules

9.2.9

9.2.9.a These regulations are according to C.5.9, Sec. 13, Chapter 1, Part 1 of the GL Rules

9.2.10

9.2.10.a This regulation is according to C.5.10, Sec. 13, Chapter 1, Part 1 of the GL Rules.

9.3 Rudder horn of semi spade rudders (case of 2-conjugate elastic support)

9.3.1 Bending moment

9.3.1.a This requirement is according to 1.7.1, Appendix 1, Chapter 10, Part B of the BV Rules.

9.3.2 Shear force

9.3.2.a This requirement is according to 1.7.2, Appendix 1, Chapter 10, Part B of the BV Rules.

9.3.3 Torque

9.3.3.a This requirement is according to 1.7.3, Appendix 1, Chapter 10, Part B of the BV Rules.

9.3.4 Shear stress calculation

9.3.4.a This requirement is according to 1.7.4, Appendix 1, Chapter 10, Part B of the BV Rules.

9.3.5 Bending stress calculation

9.3.5.a This requirement is according to 1.7.5, Appendix 1, Chapter 10, Part B of the BV Rules.

9.3.6 General remarks

9.3.6.a This regulation conforms to the regulations from 9.3.5 to 9.2.10 above (based on the regulations of C.5.5 to C.5.10 of Sec. 13, Chapter 1, Part 1, of the GL Rules).

10. RUDDER COUPLING FLANGES

10.1

10.1.1

10.1.1.a This regulation is according to B4.4.1, Sec. 19, Chapter 1, Part 1 of the GL Rules.

10.1.2

10.1.2.a This regulation is according to B4.4.2, Sec. 19, Chapter 1, Part 1 of the GL Rules.

10.1.3

10.1.3.a This regulation is according to B4.4.3, Sec. 19, Chapter 1, Part 1 of the GL Rules.

11. AZIMUTH PROPULSION SYSTEM

11.1 General

11.1.1 Arrangement

11.1.1.a This regulation is based on the regulation in 11.1, Section 1, Chapter 10, Part B of the BV Rules.

11.1.2 Application

11.1.2.a This regulation is based on the regulation in 11.1.2, Section 1, Chapter 10, Part B of the BV Rules.

11.1.3 Operating conditions

11.1.3.a This regulation is based on the regulation in 11.1.3, Section 1, Chapter 10, Part B of the BV Rules.

11.2 Arrangement

11.2.1 Plans to be submitted

11.2.1.a This regulation is based on the regulation in 11.2.1, Section 1, Chapter 10, Part B of the BV Rules.

11.2.2 Locking device

11.2.2.a This regulation is based on the regulation in 11.2.2, Section 1, Chapter 10, Part B of the BV Rules.

11.3 Design loads

11.3.1

11.3.1.a This regulation is based on the regulation in 11.3.1, Section 1, Chapter 10, Part B of the BV Rules.

11.4 Plating

11.4.1 Plating of the rudder part of the azimuth propulsion system

11.4.1.a This regulation is based on the regulation in 11.4.1, Section 1, Chapter 10, Part B of the BV Rules.

11.4.2 Plating of the pod

11.4.2.a This regulation is based on the regulation in 11.4.2, Section 1, Chapter 10, Part B of the BV Rules.

11.4.3 Webs

11.4.3.a This regulation is based on the regulation in 11.4.3, Section 1, Chapter 10, Part B of the BV Rules.

11.5 Ordinary stiffeners

11.5.1 Ordinary stiffeners of the pod

11.5.1.a This regulation is based on the regulation in 11.5.1, Section 1, Chapter 10, Part B of the BV Rules.

11.6 Primary supporting members

11.6.1 Analysis criteria

11.6.1.a This regulation is based on the regulation in 11.6.1, Section 1, Chapter 10, Part B of the BV Rules.

11.6.2 Loads

11.6.2.a This regulation is based on the regulation in 11.6.2, Section 1, Chapter 10, Part B of the BV Rules.

11.6.3 Strength check

11.6.3.a This regulation is based on the regulation in 11.6.3, Section 1, Chapter 10, Part B of the BV Rules.

11.7 Hull supports of the azimuth propulsion system

11.7.1 Analysis criteria

11.7.1.a This regulation is based on the regulation in 11.7.1, Section 1, Chapter 10, Part B of the BV Rules.

11.7.2 Loads

11.7.2.a This regulation is based on the regulation in 11.7.2, Section 1, Chapter 10, Part B of the BV Rules.

11.7.3 Strength check

11.7.3.a This regulation is based on the regulation in 11.7.3, Section 1, Chapter 10, Part B of the BV Rules.

SECTION 2 – BULWARKS AND GUARD RAILS

1. GENERAL

1.1 Introduction

1.1.1

1.1.1.a This regulation is according to 1.1.1, Section 2, Chapter 10, Part B of the BV Rules.

1.2 General

1.2.1

1.2.1.a This regulation is according to 1.2.1, Sec. 2, Chapter 10, Part B of the BV Rules, and based on Reg. 25(2) of the LL Convention, and on IACS UI LL14.

1.2.2

1.2.2.a This regulation is according to 1.2.2, Sec. 2, Chapter 10, Part B of the BV Rules, and based on Reg. 25(2) of the LL Convention.

1.2.3

1.2.3.a This regulation is according to 1.2.3, Sec. 2, Chapter 10, Part B of the BV Rules, and based on Reg. 26(7) of the LL Convention.

1.2.4

1.2.4.a This regulation is according to 1.2.4, Sec. 2, Chapter 10, Part B of the BV Rules, and based on Reg. 25(6) of the LL Convention.

1.2.5

1.2.5.a This regulation is according to 1.2.5, Section 2, Chapter 10, Part B of the BV Rules.

1.2.6

1.2.6.a This regulation is according to 1.2.6, Sec. 2, Chapter 10, Part B of the BV Rules, and based on Reg. 24(4) of the LL Convention.

1.2.7

1.2.7.a This regulation is according to 1.2.7, Section 2, Chapter 10, Part B of the BV Rules.

2. BULWARKS

2.1 General

2.1.1

2.1.1.a This regulation is according to 2.1.1, Section 2, Chapter 10, Part B of the BV Rules.

2.1.2

2.1.2.a This regulation is according to 2.1.2, Section 2, Chapter 10, Part B of the BV Rules.

2.1.3

2.1.3.a This regulation is according to 2.1.3, Section 2, Chapter 10, Part B of the BV Rules.

2.1.4

2.1.4.a This regulation is according to 2.1.4, Section 2, Chapter 10, Part B of the BV Rules.

2.2 Scantlings

2.2.1

2.2.1.a This regulation is according to 2.2.1, Section 2, Chapter 10, Part B of the BV Rules. It includes a partial modification of the BV Rules.

2.2.2

2.2.2.a This regulation is according to 2.2.2, Section 2, Chapter 10, Part B of the BV Rules.

2.2.3

2.2.3.a This regulation is according to 2.2.3, Section 2, Chapter 10, Part B of the BV Rules.

2.2.4

2.2.4.a This regulation is according to 2.2.4, Section 2, Chapter 10, Part B of the BV Rules. The formulae in the regulation have been obtained by partial modification of the formulae in BV Rules. (Same as the requirements for ships of length 92.5 m)

2.2.5

2.2.5.a This regulation is according to 2.2.5, Section 2, Chapter 10, Part B of the BV Rules.

2.2.6

2.2.6.a This regulation is according to 2.2.6, Section 2, Chapter 10, Part B of the BV Rules.

3. GUARD RAILS

3.1 General

3.1.1

3.1.1.a This regulation is according to 3.1.1, Section 2, Chapter 10, Part B of the BV Rules.

3.1.2

3.1.2.a This regulation is according to 3.1.2, Sec. 2, Chapter 10, Part B of the BV Rules, and based on Reg. 25(3) of the LL Convention.

3.1.3

3.1.3.a This regulation is according to 3.1.3, Sec. 2, Chapter 10, Part B of the BV Rules, and based on Reg. 25(3) of the LL Convention.

3.1.4

3.1.4.a This regulation is according to 3.1.4, Sec. 2, Chapter 10, Part B of the BV Rules, and based on Reg. 25(3) of the LL Convention.

3.1.5

3.1.5.a This regulation is according to 3.1.5, Sec. 2, Chapter 10, Part B of the BV Rules, and based on Reg. 25(3)(c) of the LL Convention.

3.1.6

3.1.6.a This regulation is according to 3.1.6, Sec. 2, Chapter 10, Part B of the BV Rules, and based on Reg. 25(3)(d) of the LL Convention.

SECTION 3 – EQUIPMENT

4. GENERAL

4.1 General

4.1.1

4.1.1.a This regulation is based on 1.1.1, Section 4, Chapter 10, Part B of the RINA Rules.

4.1.2

4.1.2.a This regulation is based on 1.1.2, Section 4, Chapter 10, Part B of the RINA Rules.

4.1.3

4.1.3.a This regulation is based on IACS UR A1.1.4.

4.1.4

4.1.4.a This regulation is based on 1.1.3, Section 4, Chapter 10, Part B of the RINA Rules.

5. EQUIPMENT NUMBER

5.1 Equipment number

5.1.1 General

5.1.1.a This regulation is according to 2.1.1, Section 4, Chapter 10, Part B of the RINA Rules, and based on IACS UR A1.2.

5.1.2 Equipment number

5.1.2.a This regulation is according to 2.1.2, Section 4, Chapter 10, Part B of the RINA Rules, and based on IACS UR A1.2.

6. EQUIPMENT

6.1 General

6.1.1

6.1.1.a This regulation is based on 3.1.1, Section 4, Chapter 10, Part B of the RINA Rules.

6.1.2

6.1.2.a This regulation is based on 3.1.2, Section 4, Chapter 10, Part B of the RINA Rules.

6.2 Anchors

6.2.1 General

6.2.1.a This regulation is according to 3.2., Section 4, Chapter 10, Part B of the RINA Rules, and based on IACS UR A1.4.1.

6.2.2 Ordinary anchors

- 6.2.2.a This regulation is according to 3.2., Section 4, Chapter 10, Part B of the RINA Rules, and based on IACS UR A1.4.1.

6.2.3 High and very high holding power anchors

- 6.2.3.a This regulation is according to 3.2., Section 4, Chapter 10, Part B of the RINA Rules, and based on IACS UR A1.4.1.

6.2.4 Third anchor

- 6.2.4.a This regulation is according to 3.2., Section 4, Chapter 10, Part B of the RINA Rules, and based on IACS UR A1.4.1.

6.2.5 Test for high holding power anchors approval

- 6.2.5.a This regulation is according to 3.2., Section 4, Chapter 10, Part B of the RINA Rules, and based on IACS UR A1.4.1.

6.2.6 Test for very high holding power anchors approval

- 6.2.6.a This regulation is according to 3.2., Section 4, Chapter 10, Part B of the RINA Rules, and based on IACS UR A1.4.1.

6.2.7 Specification for test on high holding power and very high holding power anchors

- 6.2.7.a This regulation is according to 3.2., Section 4, Chapter 10, Part B of the RINA Rules, and based on IACS UR A1.4.1.

6.3 Chain cables for anchors

6.3.1 Material

- 6.3.1.a This regulation is according to 3.3, Section 4, Chapter 10, Part B of the RINA Rules, and based on IACS UR A1.5.

6.3.2 Scantlings of stud link chain cables

- 6.3.2.a This regulation is according to 3.3, Section 4, Chapter 10, Part B of the RINA Rules, and based on IACS UR A1.5.

6.3.3 Studless link chain cables

- 6.3.3.a This regulation is according to 3.3, Section 4, Chapter 10, Part B of the RINA Rules, and based on IACS UR A1.5.

6.3.4 Chain cable arrangement

- 6.3.4.a This regulation is according to 3.3, Section 4, Chapter 10, Part B of the RINA Rules, and based on IACS UR A1.5.

6.3.5 Wire ropes

- 6.3.5.a This regulation is according to 3.3, Section 4, Chapter 10, Part B of the RINA Rules, and based on IACS UR A1.5.

6.4 Attachment pieces

6.4.1 General

6.4.1.a This regulation is according to 3.4, Sec. 4, Chapter 10, Part B of the RINA Rules.

6.4.2 Scantling

6.4.2.a This regulation is according to 3.4, Sec. 4, Chapter 10, Part B of the RINA Rules.

6.4.3 Material

6.4.3.a This regulation is according to 3.4, Sec. 4, Chapter 10, Part B of the RINA Rules.

6.4.4 Spare attachment pieces

6.4.4.a This regulation is according to 3.4, Sec. 4, Chapter 10, Part B of the RINA Rules.

6.5 Towlines and mooring lines

6.5.1 General

6.5.1.a This regulation is according to 3.5, Sec. 4, Chapter 10, Part B of the RINA Rules.

6.5.2 Materials

6.5.2.a This regulation is according to 3.5, Sec. 4, Chapter 10, Part B of the RINA Rules.

6.5.3 Steel wires

6.5.3.a This regulation is according to 3.5, Sec. 4, Chapter 10, Part B of the RINA Rules.

6.5.4 Number of mooring lines

6.5.4.a This regulation is according to 3.5, Sec. 4, Chapter 10, Part B of the RINA Rules.

6.5.5 Length of mooring lines

6.5.5.a This regulation is according to 3.5, Sec. 4, Chapter 10, Part B of the RINA Rules.

6.5.6 Equivalence between the breaking loads of synthetic and natural fibre ropes

6.5.6.a This regulation is according to 3.5, Sec. 4, Chapter 10, Part B of the RINA Rules. The treatment of synthetic fibre rope specified in 3.5.6 also differs from the conventional treatment.

6.6 Hawse pipes

6.6.1

6.6.1.a This regulation is according to 3.6, Section 4, Chapter 10, Part B of the RINA Rules.

6.6.2

6.6.2.a This regulation is according to 3.6, Section 4, Chapter 10, Part B of the RINA Rules.

6.6.3

6.6.3.a This regulation is according to 3.6, Section 4, Chapter 10, Part B of the RINA Rules.

6.7 Windlass

6.7.1 General

6.7.1.a This regulation is according to 3.7., Section 4, Chapter 10, Part B of the RINA Rules, and includes the requirements of IACS UR S27.4.2.

6.7.2 Assumptions for the calculation of the continuous duty pull

6.7.2.a This regulation is according to 3.7., Section 4, Chapter 10, Part B of the RINA Rules, and includes the requirements of IACS UR S27.4.2.

6.7.3 Calculation of the continuous duty pull

6.7.3.a This regulation is according to 3.7., Section 4, Chapter 10, Part B of the RINA Rules, and includes the requirements of IACS UR S27.4.2.

6.7.4 Temporary overload capacity

6.7.4.a This regulation is according to 3.7., Section 4, Chapter 10, Part B of the RINA Rules, and includes the requirements of IACS UR S27.4.2.

6.7.5 Normal hoisting speed

6.7.5.a This regulation is according to 3.7., Section 4, Chapter 10, Part B of the RINA Rules, and includes the requirements of IACS UR S27.4.2.

6.7.6 Windlass brake

6.7.6.a This regulation is according to 3.7., Section 4, Chapter 10, Part B of the RINA Rules, and includes the requirements of IACS UR S27.4.2.

6.7.7 Chain stoppers

6.7.7.a This regulation is according to 3.7., Section 4, Chapter 10, Part B of the RINA Rules, and includes the requirements of IACS UR S27.4.2.

6.7.8 Green sea loads

6.7.8.a This regulation is according to 3.7., Section 4, Chapter 10, Part B of the RINA Rules, and includes the requirements of IACS UR S27.4.2.

6.7.9 Forces in the securing devices of windlasses due to green sea loads

6.7.9.a This regulation is according to 3.7., Section 4, Chapter 10, Part B of the RINA Rules, and includes the requirements of IACS UR S27.4.2.

6.7.10 Strength criteria for windlass subject to anchor and chain loads

6.7.10.a This regulation is according to 3.7., Section 4, Chapter 10, Part B of the RINA Rules, and includes the requirements of IACS UR S27.4.2.

6.7.11 Strength criteria for securing devices of windlass

6.7.11.a This regulation is according to 3.7., Section 4, Chapter 10, Part B of the RINA Rules, and includes the requirements of IACS UR S27.4.2.

6.7.12 Connection with deck

6.7.12.a This regulation is according to 3.7., Section 4, Chapter 10, Part B of the RINA Rules, and includes the requirements of IACS UR S27.4.2.

6.8 Chain stoppers

6.8.1

6.8.1.a This regulation is according to 3.8, Section 4, Chapter 10, Part B of the RINA Rules.

6.8.2

6.8.2.a This regulation is according to 3.8, Section 4, Chapter 10, Part B of the RINA Rules.

6.9 Chain locker

6.9.1

6.9.1.a This regulation is according to 3.9, Section 4, Chapter 10, Part B of the RINA Rules. It includes the requirements of IACS UR L4.

6.9.2

6.9.2.a This regulation is according to 3.9, Section 4, Chapter 10, Part B of the RINA Rules. It includes the requirements of IACS UR L4.

6.9.3

6.9.3.a This regulation is according to 3.9, Section 4, Chapter 10, Part B of the RINA Rules. It includes the requirements of IACS UR L4.

6.9.4

6.9.4.a This regulation is according to 3.9, Section 4, Chapter 10, Part B of the RINA Rules. It includes the requirements of IACS UR L4.

6.10 Fairleads and bollards

6.10.1

6.10.1.a This regulation is according to 3.10, Section 4, Chapter 10, Part B of the RINA Rules.