

# Common Structural Rules for Bulk Carriers, January 2006

## Background Document

### CHAPTER 9 – OTHER STRUCTURES

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## SECTION 1 – FORE PART

### 1. GENERAL

#### 1.1 Application

##### 1.1.1

1.1.1.a The requirements applicable to the forward part defined in 2.1.2 Section 1, Chapter 1 are specified as applicable regulations.

#### 1.2 Net thicknesses

##### 1.2.1

1.2.1.a The applicability of net scantling approach to structural members of the forward part has been clarified.

### 2. ARRANGEMENT

#### 2.1 Structural arrangement principles

##### 2.1.1 General

2.1.1.a This sub-section is set as regulations related to the continuity of structures in the forward part from cargo hold structures, referring to the regulations of various classification societies.

##### 2.1.2 Structures in tanks

2.1.2.a This sub-section is set as regulations related to the continuity of structures in the forward part from cargo hold structures, referring to the regulations of various classification societies.

#### 2.2 Tripping brackets

##### 2.2.1

2.2.1.a The requirements of hold frames in the forward-most part of the cargo hold according to IACS UR S12 were adopted for the forward part in a transverse framing system.

#### 2.3 Floors and bottom girders

##### 2.3.1

2.3.1.a The regulations related to transverse framing system are according to GL Rules. The same regulations as for the transverse arrangement of cargo compartments were used for the longitudinal framing system.

##### 2.3.2 Solid floors

2.3.2.a The regulations related to transverse framing system are according to GL Rules. The same regulations as for the transverse arrangement of cargo compartments were used for the longitudinal framing system.

### **2.3.3 Bottom girders**

- 2.3.3.a The regulations related to transverse framing system are according to GL Rules. The same regulations as for the transverse arrangement of cargo compartments were used for the longitudinal framing system.

## **3. LOAD MODEL**

### **3.1 Load point**

#### **3.1.1**

- 3.1.1.a Since all load assessment points are common to local strength assessment, the relevant regulations of Section 1 and Section 2 of Chapter 6 are referred to.

### **3.2 Pressure in bow area**

#### **3.2.1 Lateral pressure in intact conditions**

- 3.2.1.a The loads to be considered are specified in 3.2.1 to 3.2.4. The basic concepts considered related to loads are static loads, wave loads corresponding to 4 load cases, and hydrostatic test loads; the damaged condition is not considered. For assessment of loads on outer plating, loads from pressure from internal compartments and from external pressure acting simultaneously are considered, similar to the loads on ballast tanks from internal compartments.

#### **3.2.2 Lateral pressure in testing conditions**

- 3.2.2.a The loads to be considered are specified.

#### **3.2.3 Elements of the outer shell**

- 3.2.3.a The loads to be considered are specified.

#### **3.2.4 Elements other than those of the outer shell**

- 3.2.4.a The loads to be considered are specified.

### **3.3 Bow flare area pressure**

#### **3.3.1**

- 3.3.1.a Regulations related to loads (external pressure) are summarized in Section 5, Chapter 4. These regulations were referred to when setting regulations for bow pressure in the flare area. The internal pressure is not considered when calculating scantlings using pressure in the flare area specified in 4.1.1 Section 5, Chapter 4.

### **3.4 Bottom slamming pressure**

#### **3.4.1**

- 3.4.1.a Regulations related to loads (external pressure) are summarized in Section 5, Chapter 4. These regulations were referred to when setting regulations for bottom slamming pressure. The internal pressure is not considered when calculating scantlings using the design bottom slamming pressure specified in 4.2.1, Section 5, Chapter 4.



## **4. SCANTLINGS**

### **4.1 Bow flare reinforcement**

#### **4.1.1**

- 4.1.1.a Based on GL Rules, the regulation for the bow flare part applies to the structure located forward of  $0.9L$  from the stern and above the normal ballast waterline.

### **4.2 Plating**

#### **4.2.1**

- 4.2.1.a The minimum plating thickness of the bow compartment was made the same as the minimum plating thickness used in cargo compartments. The formula for calculating the required plating thickness is the same as the formula for calculating the plating thickness in the cargo compartments. However, since the stress due to vertical bending moment is small, the parameter related to axial load and safety margin was fixed at 0.9 so that the required plating thickness can be calculated easily.

### **4.3 Ordinary stiffeners**

#### **4.3.1 General**

- 4.3.1.a Basically, the regulation for stiffeners was taken as the same as the regulation for minimum plating thickness of web used in cargo compartments and the required scantling regulation. Similar to the treatment of required plating thickness mentioned above, the parameter related to axial load and safety margin was fixed at 0.9 for the stress due to vertical bending moment.

#### **4.3.2**

- 4.3.2.a Basically, the regulation for stiffeners was taken as the same as the regulation for minimum plating thickness of web used in cargo compartments and the required scantling regulation. Similar to the treatment of required plating thickness mentioned above, the parameter related to axial load and safety margin was fixed at 0.9 for the stress due to vertical bending moment.

#### **4.3.3**

- 4.3.3.a Basically, the regulation for stiffeners was taken as the same as the regulation for minimum plating thickness of web used in cargo compartments and the required scantling regulation. Similar to the treatment of required plating thickness mentioned above, the parameter related to axial load and safety margin was fixed at 0.9 for the stress due to vertical bending moment.

#### **4.3.4**

- 4.3.4.a Basically, the regulation for stiffeners was taken as the same as the regulation for minimum plating thickness of web used in cargo compartments and the required scantling regulation. Similar to the treatment of required plating thickness mentioned above, the parameter related to axial load and safety margin was fixed at 0.9 for the stress due to vertical bending moment.

### 4.3.5

4.3.5.a Regulations for multi-spans are the same as in 3.5, Section 2, Chapter 6.

## 4.4 Primary supporting members

### 4.4.1 Minimum thickness

4.4.1.a The regulation for minimum plating thickness of primary supporting members in cargo compartments namely  $0.6\sqrt{L}$  was corrected to  $0.7\sqrt{L}$  considering actual measurements.

### 4.4.2 Side transverses

4.4.2.a Only bending strength and shear strength were considered for estimating the required scantlings of primary supporting members. The scantling formula of primary supporting members are the same as those for ordinary stiffeners.

### 4.4.3 Side girders

4.4.3.a Only bending strength and shear strength were considered for estimating the required scantlings of primary supporting members. The scantling formula of primary supporting members are the same as those for ordinary stiffeners.

### 4.4.4 Deck primary supporting members

4.4.4.a Regulation for deck primary supporting members are the same as in Section 4, Chapter 6.

## 5. STRENGTHENING OF FLAT BOTTOM FORWARD AREA

### 5.1 Application

#### 5.1.1

5.1.1.a The requirement for strengthening forward bottom area,  $0.2V\sqrt{L}$ , is base on NK Rules. The strengthening range in the vertical direction is based on the GL Rules.

### 5.2 Bottom plating

#### 5.2.1

5.2.1.a The plating thickness formula was set after considering the damage results; therefore, the yield strength of the material and the axial load were not considered in the general formula for required plating thickness. Moreover, in ships where additional stiffeners (intermediate stiffeners) are installed in the spacing between ordinary stiffeners, the stiffener spacing is halved, the slamming load is also halved, and sometimes the damage cannot be explained. Thus, an overdesign factor associated with the area of the loading considered is introduced after considering the stiffener formula also.

#### 5.2.2

5.2.2.a It is considered that for this topic, no information in addition to that shown in the Rules is necessary to explain the background.

### 5.3 Ordinary Stiffeners

#### 5.3.1

5.3.1.a For normal loads, the requirements for stiffeners were based on elastic design. However, considering the applicable slamming loads and measures against damage (refer to Fig. 9.1), the plastic moment was used.

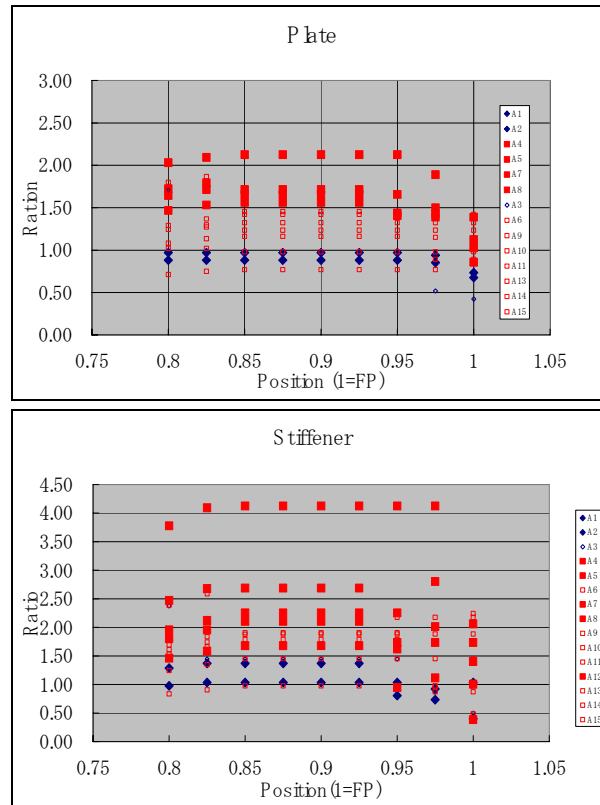


Fig. 9.1 Comparison of damage data and required values

5.3.1.b In Fig. 9.1, the horizontal axis gives the position along the length of the ship, while the vertical axis shows the ratio of required scantling to actual scantling. The large marks in the same figure indicate damage data.

5.3.1.c From the figure, it can be seen that except for a part near the FP, damaged locations fall in a range that requires strengthening.

#### 5.3.2

5.3.2.a

### 5.4 Primary supporting members

#### 5.4.1 Girders

5.4.1.a Regulations related to shear buckling and compressive buckling of webs and shear strength when girders are treated as beams are based on NK Rules.

## 5.4.2 Floors

- 5.4.2.a Regulations related to shear buckling and compressive buckling of webs and shear strength when girders are treated as beams are based on NK Rules.

## 6. STEM

### 6.1 Bar stem

#### 6.1.1

- 6.1.1.a This regulation is based on the regulations B1.1 of Section 13, Chapter I-1-1 of the GL Rules. Note that this regulation relates to gross scantlings.

#### 6.1.2

- 6.1.2.a This regulation is based on the regulations B1.2 of Section 13, Chapter I-1-1 of the GL Rules. Note that this regulation relates to gross scantlings.

### 6.2 Plate stem and bulbous bows

#### 6.2.1

- 6.2.1.a This regulation is based on the regulations B2.1 of Section 13, Chapter I-1-2 of the GL Rules. The maximum plating thickness in GL Rules is taken as  $25\sqrt{k}$ . Although no problem arises if the thickness is smaller than this value, the plating thickness was taken as  $22\sqrt{k}$  to arrive at a practically feasible numeric value. Note that this regulation relates to gross scantlings.

#### 6.2.2

- 6.2.2.a This regulation is based on the regulations B2.2 of Section 13, Chapter I-1-2 of the GL Rules.

#### 6.2.3

- 6.2.3.a This regulation is based on the regulations B2.3 of Section 13, Chapter I-1-2 of the GL Rules.

## 7. FORECASTLE

### 7.1 General

#### 7.1.1

- 7.1.1.a This regulation is in accordance with IACS UR S28.

#### 7.1.2

- 7.1.2.a This regulation is in accordance with IACS UR S28.

#### 7.1.3

- 7.1.3.a This regulation is in accordance with IACS UR S28.

**7.1.4**

7.1.4.a This regulation is in accordance with IACS UR S28.

## SECTION 2 – AFT PART

### 1. GENERAL

#### 1.1 Introduction

##### 1.1.1

1.1.1.a This regulation is based on 1.1.1, Section 2, Chapter 9, Part B of the RINA Rules.

##### 1.1.2

1.1.2.a This regulation is based on 1.1.2, Section 2, Chapter 9, Part B of the RINA Rules. This regulation is for the structure in the aft part. Structural members other than outer plating that form the boundaries of compartment in which liquid is not carried, are based on the design concept of scantlings considering pressure when flooded.

#### 1.2 Connections of the aft part with structures located fore of the aft peak bulkhead

##### 1.2.1 Tapering

1.2.1.a This regulation is based on 1.2.1, Section 9, Chapter 2, Part B of the RINA Rules.

#### 1.3 Net scantlings

##### 1.3.1

1.3.1.a This regulation is based on 1.3.1, Section 2, Chapter 9, Part B of the RINA Rules.

### 2. LOAD MODEL

#### 2.1 Load point

##### 2.1.1

2.1.1.a These regulations are based on 2.2 and 2.3 of Sec. 2, Chapter 9, Part B of the RINA Rules, and are the same as the regulations of Sections 1 and 2 of Chapter 6.

#### 2.2 Lateral pressures

##### 2.2.1 Lateral pressure in intact conditions

2.2.1.a These regulations are based on 2.2 and 2.3 of Sec. 2, Chapter 9, Part B of the RINA Rules, and are the same as the regulations of Sections 1 and 2 of Chapter 6.

##### 2.2.2 Lateral pressure in testing conditions

2.2.2.a These regulations are based on 2.2 and 2.3 of Sec. 2, Chapter 9, Part B of the RINA Rules, and are the same as the regulations of Sections 1 and 2 of Chapter 6.

### **2.2.3 Elements of the outer shell**

2.2.3.a These regulations are based on 2.2 and 2.3 of Sec. 2, Chapter 9, Part B of the RINA Rules, and are the same as the regulations of Sections 1 and 2 of Chapter 6.

### **2.2.4 Elements other than those of the outer shell**

2.2.4.a These regulations are based on 2.2 and 2.3 of Sec. 2, Chapter 9, Part B of the RINA Rules, and are the same as the regulations of Sections 1 and 2 of Chapter 6.

## **3. AFT PEAK**

### **3.1 Arrangement**

#### **3.1.1 General**

3.1.1.a These regulations are based on the regulations of 3.1, Section 2, Chapter 9, Part B of the RINA Rules.

#### **3.1.2 Floors**

3.1.2.a These regulations are based on the regulations of 3.1, Section 2, Chapter 9, Part B of the RINA Rules.

#### **3.1.3 Side frames**

3.1.3.a These regulations are based on the regulations of 3.1, Section 2, Chapter 9, Part B of the RINA Rules.

#### **3.1.4 Platforms and side girders**

3.1.4.a These regulations are based on the regulations of 3.1, Section 2, Chapter 9, Part B of the RINA Rules.

#### **3.1.5 Longitudinal bulkheads**

3.1.5.a These regulations are based on the regulations of 3.1, Section 2, Chapter 9, Part B of the RINA Rules.

## **4. SCANTLINGS**

### **4.1 Side plating**

#### **4.1.1**

4.1.1.a The minimum scantling was adjusted to match the required scantling of the structures in the cargo compartments. Similar to the bow part, the required net plating thickness was taken as the formula used in the aft part for loads specified in Chapter 4, taking the factor associated with the axial load and safety margin as 0.9.

### **4.2 Ordinary Stiffeners**

#### **4.2.1 General**

4.2.1.a The regulation is the same as the regulation in the forward part.

#### **4.2.2**

4.2.2.a The regulation is the same as the regulation in the forward part.

#### **4.2.3**

4.2.3.a The regulation is the same as the regulation in the forward part.

#### **4.2.4**

4.2.4.a The regulation is the same as the regulation in the forward part.

#### **4.2.5**

4.2.5.a The regulation is the same as the regulation in the forward part.

### **4.3 Primary supporting members**

#### **4.3.1 Floors**

4.3.1.a The regulation is the same as the regulation in the forward part.

#### **4.3.2 Side transverses**

4.3.2.a The regulation is the same as the regulation in the forward part.

#### **4.3.3 Side girders**

4.3.3.a The regulation is the same as the regulation in the forward part.

#### **4.3.4 Deck primary supporting members**

4.3.4.a The regulation is the same as the regulation in the forward part.

## **5. CONNECTION OF HULL STRUCTURES WITH THE RUDDER HORN**

### **5.1 Connection of aft peak structures with the rudder horn**

#### **5.1.1 General**

5.1.1.a This regulation is based on the regulations of 5.1 and 5.2, Section 2, Chapter 9, Part B, of the RINA Rules.

#### **5.1.2 Rudder horn**

5.1.2.a This regulation is based on the regulations of 5.1 and 5.2, Section 2, Chapter 9, Part B, of the RINA Rules.

#### **5.1.3 Hull structures**

5.1.3.a This regulation is based on the regulations of 5.1 and 5.2, Section 2, Chapter 9, Part B, of the RINA Rules.



## **5.2 Structural arrangement above the aft peak**

### **5.2.1 Side transverses**

5.2.1.a This regulation is based on the regulations of 5.1 and 5.2, Section 2, Chapter 9, Part B, of the RINA Rules.

### **5.2.2 Side girders**

5.2.2.a This regulation is based on the regulations of 5.1 and 5.2, Section 2, Chapter 9, Part B, of the RINA Rules.

## **6. STERNFRAMES**

### **6.1 General**

#### **6.1.1**

6.1.1.a This regulation is based on the regulations of 6.1, 6.2, 6.3, 6.5 and 6.7, Section 2, Chapter 9, Part B of the RINA Rules.

6.1.1.b The plating thickness in the regulations is the net plating thickness.

#### **6.1.2**

6.1.2.a This regulation is based on the regulations of 6.1, 6.2, 6.3, 6.5 and 6.7, Section 2, Chapter 9, Part B of the RINA Rules.

### **6.2 Connections**

#### **6.2.1 Connection with hull structure**

6.2.1.a This regulation is based on the regulations of 6.1, 6.2, 6.3, 6.5 and 6.7, Section 2, Chapter 9, Part B of the RINA Rules assuming the material factor  $k = 1$  to simplify the formula in a conservative way.

#### **6.2.2 Connection with the keel**

6.2.2.a This regulation is based on the regulations of 6.1, 6.2, 6.3, 6.5 and 6.7, Section 2, Chapter 9, Part B of the RINA Rules.

#### **6.2.3 Connection with transom floors**

6.2.3.a This regulation is based on the regulations of 6.1, 6.2, 6.3, 6.5 and 6.7, Section 2, Chapter 9, Part B of the RINA Rules assuming the material factor  $k = 1$  to simplify the formula in a conservative way.

#### **6.2.4 Connection with centre keelson**

6.2.4.a This regulation is based on the regulations of 6.1, 6.2, 6.3, 6.5 and 6.7, Section 2, Chapter 9, Part B of the RINA Rules.

### **6.3 Propeller posts**

#### **6.3.1 Gross scantlings**

6.3.1.a This regulation is based on the regulations of 6.1, 6.2, 6.3, 6.5 and 6.7, Section 2, Chapter 9, Part B of the RINA Rules.

#### **6.3.2 Gross scantlings of propeller posts**

6.3.2.a This regulation is based on the regulations of 6.1, 6.2, 6.3, 6.5 and 6.7, Section 2, Chapter 9, Part B of the RINA Rules.

#### **6.3.3 Section modulus below the propeller shaft bossing**

6.3.3.a This regulation is based on the regulations of 6.1, 6.2, 6.3, 6.5 and 6.7, Section 2, Chapter 9, Part B of the RINA Rules.

#### **6.3.4 Welding of fabricated propeller post with the propeller shaft bossing**

6.3.4.a This regulation is based on the regulations of 6.1, 6.2, 6.3, 6.5 and 6.7, Section 2, Chapter 9, Part B of the RINA Rules.

### **6.4 Propeller shaft bossing**

#### **6.4.1**

6.4.1.a This regulation is based on the regulations of 6.1, 6.2, 6.3, 6.5 and 6.7, Section 2, Chapter 9, Part B of the RINA Rules.

### **6.5 Sterntubes**

#### **6.5.1 Sterntubes**

6.5.1.a This regulation is based on the regulations of 6.1, 6.2, 6.3, 6.5 and 6.7, Section 2, Chapter 9, Part B of the RINA Rules.

## SECTION 3 – MACHINERY SPACE

### 1. GENERAL

#### 1.1 Application

##### 1.1.1

1.1.1.a This regulation is based on the regulations of 1.1 and 1.3, Section 3, Chapter 9, Part B, of the RINA Rules.

#### 1.2 Scantlings

##### 1.2.1 Net scantlings

1.2.1.a This regulation is based on the regulations of 1.1 and 1.3, Section 3, Chapter 9, Part B, of the RINA Rules.

##### 1.2.2 General

1.2.2.a This regulation is based on the regulations of 1.1 and 1.3, Section 3, Chapter 9, Part B, of the RINA Rules.

##### 1.2.3 Primary supporting members

1.2.3.a This regulation is based on the regulations of 1.1 and 1.3, Section 3, Chapter 9, Part B, of the RINA Rules.

#### 1.3 Connections of the machinery space with structures located aft and forward

##### 1.3.1 Tapering

1.3.1.a This regulation is based on the regulations of 1.1 and 1.3, Section 3, Chapter 9, Part B, of the RINA Rules.

##### 1.3.2 Transition zone between engine room and cargo area

1.3.2.a This regulation is based on the regulations of 1.1 and 1.3, Section 3, Chapter 9, Part B, of the RINA Rules.

##### 1.3.3 Deck discontinuities

1.3.3.a This regulation is based on the regulations of 1.1 and 1.3, Section 3, Chapter 9, Part B, of the RINA Rules.

### 2. DOUBLE BOTTOM

#### 2.1 Arrangement

##### 2.1.1 General

2.1.1.a This regulation is based on the regulations of 2.1.1 and 2.1.7, Section 3, Chapter 9, Part B, of the RINA Rules.

### **2.1.2 Double bottom height**

2.1.2.a This regulation is based on the regulations of 2.1.1 and 2.1.7, Section 3, Chapter 9, Part B, of the RINA Rules.

### **2.1.3 Centre bottom girder**

2.1.3.a This regulation is based on the regulations of 2.1.1 and 2.1.7, Section 3, Chapter 9, Part B, of the RINA Rules.

### **2.1.4 Side bottom girders**

2.1.4.a This regulation is based on the regulations of 2.1.1 and 2.1.7, Section 3, Chapter 9, Part B, of the RINA Rules.

### **2.1.5 Side bottom girders in way of machinery seatings**

2.1.5.a This regulation is based on the regulations of 2.1.1 and 2.1.7, Section 3, Chapter 9, Part B, of the RINA Rules.

### **2.1.6 Floors in longitudinally framed double bottom**

2.1.6.a This regulation is based on the regulations of 2.1.1 and 2.1.7, Section 3, Chapter 9, Part B, of the RINA Rules.

### **2.1.7 Floors in transversely framed double bottom**

2.1.7.a This regulation is based on the regulations of 2.1.1 and 2.1.7, Section 3, Chapter 9, Part B, of the RINA Rules.

### **2.1.8 Floors stiffeners**

2.1.8.a This regulation is based on the regulations of 2.1.1 and 2.1.7, Section 3, Chapter 9, Part B, of the RINA Rules.

### **2.1.9 Manholes and wells**

2.1.9.a This regulation is based on the regulations of 2.1.1 and 2.1.7, Section 3, Chapter 9, Part B, of the RINA Rules.

## **2.2 Minimum thickness**

### **2.2.1**

2.2.1.a This regulation is the same as the regulations in 2.2.1, Sec. 3, Chapter 9, Part B of the RINA Rules without the use of the material factor.

## **3. SIDE**

### **3.1 Arrangement**

#### **3.1.1 General**

3.1.1.a This regulation is based on the regulations of 4.1.1 and 4.1.3, Section 3, Chapter 9, Part B, of the RINA Rules.

### **3.1.2 Extension of the hull longitudinal structure within the machinery space**

3.1.2.a This regulation is based on the regulations of 4.1.1 and 4.1.3, Section 3, Chapter 9, Part B, of the RINA Rules.

### **3.1.3 Side transverses**

3.1.3.a This regulation is based on the regulations of 4.1.1 and 4.1.3, Section 3, Chapter 9, Part B, of the RINA Rules.

## **4. PLATFORMS**

### **4.1 Arrangement**

#### **4.1.1 General**

4.1.1.a This regulation is based on the regulations of 5.1.1, Section 3, Chapter 9, Part B, of the RINA Rules. The net scantlings indicated by the L function in the RINA Rules are corrected based on the actual values.

#### **4.1.2 Platform transverses**

4.1.2.a This regulation is based on the regulations of 5.1.2, Section 3, Chapter 9, Part B, of the RINA Rules. The net scantlings indicated by the L function in the RINA Rules were corrected based on the actual values.

### **4.2 Minimum thicknesses**

#### **4.2.1**

4.2.1.a This regulation is based on the regulations of 5.1.2, Section 3, Chapter 9, Part B, of the RINA Rules.

## **5. PILLARING**

### **5.1 Arrangement**

#### **5.1.1 General**

5.1.1.a This regulation is based on the regulations of 6.1.1 and 6.1.3, Section 3, Chapter 9, Part B, of the RINA Rules.

#### **5.1.2 Pillars**

5.1.2.a This regulation is based on the regulations of 6.1.1 and 6.1.3, Section 3, Chapter 9, Part B, of the RINA Rules.

#### **5.1.3 Pillar bulkheads**

5.1.3.a This regulation is based on the regulations of 6.1.1 and 6.1.3, Section 3, Chapter 9, Part B, of the RINA Rules.

## **6. MACHINERY CASING**

### **6.1 Arrangement**

#### **6.1.1 Ordinary stiffener spacing**

6.1.1.a This regulation is based on the regulations of 7.1 and 7.3, Section 3, Chapter 9, Part B, of the RINA Rules.

### **6.2 Openings**

#### **6.2.1 General**

6.2.1.a This regulation is based on the regulations of 7.1 and 7.3, Section 3, Chapter 9, Part B, of the RINA Rules.

#### **6.2.2 Access doors**

6.2.2.a This regulation is based on the regulations of 7.1 and 7.3, Section 3, Chapter 9, Part B, of the RINA Rules.

### **6.3 Scantlings**

#### **6.3.1 Plating and ordinary stiffeners**

6.3.1.a This regulation is based on the regulations of 7.1 and 7.3, Section 3, Chapter 9, Part B, of the RINA Rules.

#### **6.3.2 Minimum thicknesses**

6.3.2.a This regulation is based on the regulations of 7.1 and 7.3, Section 3, Chapter 9, Part B, of the RINA Rules.

## **7. MAIN MACHINERY SEATING**

### **7.1 Arrangement**

#### **7.1.1 General**

7.1.1.a This regulation is based on the regulations of 8.1 and 8.3, Section 3, Chapter 9, Part B, of the RINA Rules.

#### **7.1.2 Seating supporting structure**

7.1.2.a This regulation is based on the regulations of 8.1 and 8.3, Section 3, Chapter 9, Part B, of the RINA Rules.

#### **7.1.3 Seatings included in the double bottom structure**

7.1.3.a This regulation is based on the regulations of 8.1 and 8.3, Section 3, Chapter 9, Part B, of the RINA Rules.

#### **7.1.4 Seatings above the double bottom plating**

7.1.4.a This regulation is based on the regulations of 8.1 and 8.3, Section 3, Chapter 9, Part B, of the RINA Rules.

### **7.1.5 Seatings in a single bottom structure**

7.1.5.a This regulation is based on the regulations of 8.1 and 8.3, Section 3, Chapter 9, Part B, of the RINA Rules.

### **7.1.6 Number of girders in way of machinery seatings**

7.1.6.a This regulation is based on the regulations of 8.1 and 8.3, Section 3, Chapter 9, Part B, of the RINA Rules.

## **7.2 Minimum scantlings**

### **7.2.1**

7.2.1.a This regulation is based on the regulations of 8.1 and 8.3, Section 3, Chapter 9, Part B, of the RINA Rules.

## SECTION 4 – SUPERSTRUCTURES AND DECKHOUSES

### 1. GENERAL

#### 1.1 Definitions

##### 1.1.1 Superstructure

1.1.1.a This regulation is based on the regulations of A1.1 to A1.6 and A1.8 of Section 16, Chapter I-1-1 of the GL Rules.

##### 1.1.2 Deckhouse

1.1.2.a This regulation is based on the regulations of A1.1 to A1.6 and A1.8 of Section 16, Chapter I-1-1 of the GL Rules.

##### 1.1.3 Long deckhouse

1.1.3.a This regulation is based on the regulations of A1.1 to A1.6 and A1.8 of Section 16, Chapter I-1-1 of the GL Rules.

##### 1.1.4 Short deckhouse

1.1.4.a This regulation is based on the regulations of A1.1 to A1.6 and A1.8 of Section 16, Chapter I-1-1 of the GL Rules.

##### 1.1.5 Non-effective superstructure

1.1.5.a This regulation is based on the regulations of A1.1 to A1.6 and A1.8 of Section 16, Chapter I-1-1 of the GL Rules.

##### 1.1.6 Insulated funnel

1.1.6.a This regulation is based on the regulations of A1.1 to A1.6 and A1.8 of Section 16, Chapter I-1-1 of the GL Rules.

#### 1.2 Gross scantlings

##### 1.2.1

1.2.1.a All the regulations related to superstructures are expressed by gross scantlings because the LL Convention using corrosion addition based on a concept different from that of Section 3, Chapter 3, and the regulation based on IACS UR are combined.

### 2. ARRANGEMENT

#### 2.1 Strengthening at the ends of superstructures

##### 2.1.1

2.1.1.a This regulation is based on the regulation of A3, A4, B3, A5 of Sec. 16, Chapter I-1-1 of the GL Rules, and on Rule 12(1) and (2) of the LL Convention.



## **2.1.2**

2.1.2.a This regulation is based on the regulation of A3, A4, B3, A5 of Sec. 16, Chapter I-1-1 of the GL Rules, and on Rule 12(1) and (2) of the LL Convention.

## **2.2 Attachment of stiffening members**

### **2.2.1 Attachment of deck beams**

2.2.1.a This regulation is based on the regulation of A3, A4, B3, A5 of Sec. 16, Chapter I-1-1 of the GL Rules, and on Rule 12(1) and (2) of the LL Convention.

### **2.2.2 Attachment of deck girders and transverses**

2.2.2.a This regulation is based on the regulation of A3, A4, B3, A5 of Sec. 16, Chapter I-1-1 of the GL Rules, and on Rule 12(1) and (2) of the LL Convention.

### **2.2.3 End attachment of superstructure frames**

2.2.3.a This regulation is based on the regulation of A3, A4, B3, A5 of Sec. 16, Chapter I-1-1 of the GL Rules, and on Rule 12(1) and (2) of the LL Convention.

## **2.3 Transverse structure of superstructures and deckhouses**

### **2.3.1**

2.3.1.a This regulation is based on the regulation of A3, A4, B3, A5 of Sec. 16, Chapter I-1-1 of the GL Rules, and on Rule 12(1) and (2) of the LL Convention.

## **2.4 Openings in enclosed superstructures**

### **2.4.1**

2.4.1.a This regulation is based on the regulation of A3, A4, B3, A5 of Sec. 16, Chapter I-1-1 of the GL Rules, and on Rule 12(1) and (2) of the LL Convention.

### **2.4.2**

2.4.2.a This regulation is based on the regulation of A3, A4, B3, A5 of Sec. 16, Chapter I-1-1 of the GL Rules, and on Rule 12(1) and (2) of the LL Convention.

### **2.4.3**

2.4.3.a This regulation is based on the regulation of A3, A4, B3, A5 of Sec. 16, Chapter I-1-1 of the GL Rules, and on Rule 12(1) and (2) of the LL Convention.

## **3. LOAD MODEL**

### **3.1 Load calculation point**

#### **3.1.1**

3.1.1.a This regulation is specified to maintain consistency with the regulations of Section 1 and 2, Chapter 9, and Section 1 and 2 of Chapter 6.

## **3.2 Loads**

### **3.2.1 Lateral pressure for decks**

3.2.1.a This regulation is specified to maintain consistency with the regulations of Section 1 and 2, Chapter 9, and Section 1 and 2 of Chapter 6.

### **3.2.2 Lateral pressure for exposed wheel house top**

3.2.2.a This regulation is specified to maintain consistency with the regulations of Section 1 and 2, Chapter 9, and Section 1 and 2 of Chapter 6.

### **3.2.3 Lateral pressure for sides of superstructures**

3.2.3.a This regulation is specified to maintain consistency with the regulations of Section 1 and 2, Chapter 9, and Section 1 and 2 of Chapter 6.

## **4. SCANTLINGS**

### **4.1 Side plating of non-effective superstructures**

#### **4.1.1**

4.1.1.a This regulation is based on B1, B2, B3, D1 and D2 of Sec. 16, Chapter I-1-1 of the GL Rules.

### **4.2 Deck plating of non-effective superstructures**

#### **4.2.1**

4.2.1.a This regulation is based on B1, B2, B3, D1 and D2 of Sec. 16, Chapter I-1-1 of the GL Rules.

#### **4.2.2**

4.2.2.a This regulation is based on B1, B2, B3, D1 and D2 of Sec. 16, Chapter I-1-1 of the GL Rules.

#### **4.2.3**

4.2.3.a This regulation is based on B1, B2, B3, D1 and D2 of Sec. 16, Chapter I-1-1 of the GL Rules.

### **4.3 Deck beams and supporting deck structure**

#### **4.3.1 Transverse deck beams and longitudinal ordinary stiffeners**

4.3.1.a This regulation is based on B1, B2, B3, D1 and D2 of Sec. 16, Chapter I-1-1 of the GL Rules.

#### **4.3.2 Deck girders and transverses**

4.3.2.a This regulation is based on B1, B2, B3, D1 and D2 of Sec. 16, Chapter I-1-1 of the GL Rules.

## **4.4 Superstructure frames**

### **4.4.1 Section modulus and shear area**

4.4.1.a This regulation is based on B1, B2, B3, D1 and D2 of Sec. 16, Chapter I-1-1 of the GL Rules.

### **4.4.2**

4.4.2.a This regulation is based on B1, B2, B3, D1 and D2 of Sec. 16, Chapter I-1-1 of the GL Rules.

### **4.4.3**

4.4.3.a This regulation is based on B1, B2, B3, D1 and D2 of Sec. 16, Chapter I-1-1 of the GL Rules.

## **4.5 Decks of short deckhouses**

### **4.5.1 Plating**

4.5.1.a This regulation is based on B1, B2, B3, D1 and D2 of Sec. 16, Chapter I-1-1 of the GL Rules.

### **4.5.2 Deck beams**

4.5.2.a This regulation is based on B1, B2, B3, D1 and D2 of Sec. 16, Chapter I-1-1 of the GL Rules.

## **5. SUPERSTRUCTURE END BULKHEADS AND DECKHOUSE WALLS**

### **5.1 Application**

#### **5.1.1**

5.1.1.a Design loads are based on IACS UR S3. The regulations are based on C3.1 and 3.2, Sec. 16, Chapter I-1-1 of the GL Rules, in addition to the regulations of Section 5, Chapter 4.

### **5.2 Loads**

#### **5.2.1**

5.2.1.a The loads to be considered are specified.

### **5.3 Scantlings**

#### **5.3.1 Stiffeners**

5.3.1.a This requirement is based on GL Rules.

#### **5.3.2 Plate thickness**

5.3.2.a This requirement is based on GL Rules.

## SECTION 5 – HATCH COVERS

### 1. GENERAL

#### 1.1 Application

##### 1.1.1

- 1.1.1.a The regulations of this section are based on the International Load Line Convention, IACS UR S21 and UR S26 and Section 7, Chapter 9, Part B of the BV Rules. When internal pressure of ballast water in the ballast hold is considered, the hatch cover is treated as not being acted upon by hydrostatic pressure from the air vent installed in the hatch coaming.
- 1.1.1.b To consider this, the loads due to ballast in the ballast hold specified in Section 6 Chapter 4 were divided into hydrostatic pressure and dynamic pressure, the hydrostatic pressure was multiplied by 0 and the dynamic pressure by 0.9.

#### 1.2 Materials

##### 1.2.1 Steel

- 1.2.1.a This requirement is based on [1.2.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

##### 1.2.2 Other materials

- 1.2.2.a This requirement is based on [1.2.2] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### 1.3 Net scantlings

##### 1.3.1

- 1.3.1.a This requirement is based on [1.3.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### 1.4 Corrosion additions

##### 1.4.1

- 1.4.1.a This requirement is based on UR S21.6.1 and [1.5.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### 1.5 Allowable stresses

##### 1.5.1

- 1.5.1.a This requirement is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.(15.6) and (16.5)) and [1.4] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

## **2. ARRANGEMENTS**

### **2.1 Height of hatch coamings**

#### **2.1.1**

2.1.1.a This requirement is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.14 (1,1)) and [2.1.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **2.1.2**

2.1.2.a This requirement is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.14 (1,2)) and [2.1.2] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **2.1.2.b**

### **2.2 Hatch covers**

2.2.1.a This requirement is based on [2.2.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **2.2.2**

2.2.2.a This requirement is based on UR S21.1 and [2.2.2] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **2.2.3**

2.2.3.a This requirement is based on UR S21.1 and [2.2.3] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **2.2.4**

2.2.4.a This requirement is based on UR S21.3.5 and [2.2.4] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **2.2.5**

2.2.5.a This requirement is based on [2.2.6] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **2.2.6**

2.2.6.a This requirement is based on [2.2.7] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **2.3 Hatch coamings**

#### **2.3.1**

2.3.1.a This requirement is based on [2.3.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **2.3.2**

2.3.2.a This requirement is based on [2.3.2] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **2.3.3**

- 2.3.3.a This requirement is based on [2.3.3] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **2.3.4**

- 2.3.4.a This requirement specifies the structural continuity under transverse coamings.

## **2.4 Small hatchways**

### **2.4.1**

- 2.4.1.a This requirement is based on [2.4.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **2.4.2**

- 2.4.2.a This requirement is based on [2.4.2] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **2.4.3**

- 2.4.3.a This requirement is based on [2.4.3] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **2.4.4**

- 2.4.4.a This requirement is based on [2.4.4] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **2.4.5**

- 2.4.5.a This requirement is based on [2.4.5] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

## **3. WIDTH OF ATTACHED PLATING**

### **3.1 Ordinary stiffeners**

#### **3.1.1**

- 3.1.1.a This requirement is based on [3.1.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **3.2 Primary supporting members**

#### **3.2.1**

- 3.2.1.a This requirement is based on UR S21.3.2 and [3.2.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

## **4. LOAD MODEL**

### **4.1 Lateral pressures and forces**

#### **4.1.1 General**

4.1.1.a This requirement is based on UR S21.2 and [4.1.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **4.1.2 Sea pressures**

4.1.2.a This requirement is based on UR S21.2 and [4.1.2] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **4.1.3 Internal pressures due to ballast water**

4.1.3.a This requirement is based on [4.1.3] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **4.1.4 Pressures due to uniform cargoes**

4.1.4.a This requirement is based on [4.1.4] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **4.1.5 Pressures or forces due to special cargoes**

4.1.5.a This requirement is based on [4.1.7] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **4.1.6 Forces due to containers**

4.1.6.a This requirement is based on [4.1.5] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **4.2 Load point**

#### **4.2.1 Wave lateral pressure for hatch covers on exposed decks**

4.2.1.a This requirement is based on UR S21.2 and [4.3.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **4.2.2 Lateral pressures other than the wave pressure**

4.2.2.a This requirement is based on [4.3.2] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

4.2.2.b

## **5. STRENGTH CHECK**

### **5.1 General**

#### **5.1.1 Application**

5.1.1.a This requirement is based on UR S21.3.1 and [5.1.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **5.1.2 Hatch covers supporting containers**

- 5.1.2.a This requirement specifies that container loads are to be considered, if any. As no container loads are defined in CSR for Bulk Carriers, they are to be determined by each Society.

### **5.1.3 Hatch covers subjected to special cargoes**

- 5.1.3.a This requirement is based on [5.1.3] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **5.1.4 Covers of small hatchways**

- 5.1.4.a This requirement is based on [5.1.4] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

## **5.2 Plating**

### **5.2.1 Net thickness**

- 5.2.1.a This requirement is based on UR S21.3.3 and [5.2.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **5.2.2 Minimum net thickness**

- 5.2.2.a This requirement is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.16 (5, c)) and [5.2.2] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **5.2.3 Critical buckling stress check**

- 5.2.3.a This requirement is based on UR S21.3.6.1 and [5.2.3] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

## **5.3 Ordinary stiffeners**

### **5.3.1**

- 5.3.1.a This requirement is based on UR S21.3.6.2 and [5.3.2] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **5.3.2 Minimum net thickness of web**

- 5.3.2.a This requirement is based on [5.3.7] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **5.3.3 Net section modulus and net shear sectional area**

- 5.3.3.a This requirement is based on UR S21.3.4 and [5.3.6] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **5.3.4 Critical buckling stress check**

- 5.3.4.a This requirement is based on UR S21.3.6.2 and [5.3.5 b] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.



## **5.4 Primary supporting members**

### **5.4.1 Application**

5.4.1.a This requirement is based on UR S21.3.5 and [5.3.3] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **5.4.2 Minimum net thickness of web**

5.4.2.a This requirement is based on [5.3.7] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **5.4.3 Normal and shear stress for isolated beam**

5.4.3.a This requirement is based on [5.3.4] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **5.4.4 Checking criteria**

5.4.4.a This requirement is based on UR S21.3.1 and [5.3.5] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **5.4.5 Deflection limit**

5.4.5.a This requirement is based on UR S21.3.7 and [5.3.5 d)] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **5.4.6 Critical buckling stress check of the web panels of the primary supporting members**

5.4.6.a This requirement is based on UR S21.3.6.3 and [5.3.5 c)] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

## **5.5 Ordinary stiffeners and primary supporting members of variable cross-section**

### **5.5.1**

5.5.1.a This requirement is based on [5.3.8] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

## **6. HATCH COAMINGS**

### **6.1 Stiffening**

#### **6.1.1**

6.1.1.a This requirement is based on UR S21.1 and [6.1.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **6.1.2**

6.1.2.a This requirement is based on [6.1.2] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **6.1.3**

6.1.3.a This requirement is based on [6.1.3] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **6.1.4**

6.1.4.a This requirement is based on [6.1.4] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **6.1.5**

6.1.5.a This requirement is based on [6.1.5] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

## **6.2 Load model**

### **6.2.1**

6.2.1.a This requirement is based on UR S21.4.1 and [6.2.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **6.2.2**

6.2.2.a This requirement is based on UR S21.4.1 and [6.2.2] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **6.2.3**

6.2.3.a This requirement is based on UR S21.4.1 and [6.2.3] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **6.2.4**

6.2.4.a This requirement is based [6.2.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

## **6.3 Scantlings**

### **6.3.1 Plating**

6.3.1.a This requirement is based on UR S21.4.2 and [6.4.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **6.3.2 Ordinary stiffeners**

6.3.2.a This requirement is based on UR S21.4.3 and [6.4.2] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **6.3.3 Coaming stays**

6.3.3.a This requirement is based on UR S21.4.4 and [6.4.3] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **6.3.4 Local details**

6.3.4.a This requirement is based on UR S21.4.5 and [6.4.4] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships

### **6.3.5 Coamings of small hatchways**

6.3.5.a This requirement is based on [6.3.5] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

## **7. WEATHERTIGHTNESS, CLOSING ARRANGEMENT, SECURING DEVICES AND STOPPERS**

### **7.1 Weathertightness**

#### **7.1.1**

7.1.1.a This requirement is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.16 (1)) and [7.1.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **7.1.2**

7.1.2.a This requirement is based on [7.1.2] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **7.2 Gaskets**

#### **7.2.1**

7.2.1.a This requirement is based on [7.2.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **7.2.2**

7.2.2.a This requirement is based on [7.2.2] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **7.2.3**

7.2.3.a This requirement is based on [7.2.3] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships

#### **7.2.4**

7.2.4.a This requirement is based on [7.2.4] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **7.2.5**

7.2.5.a This requirement is based on [7.2.5] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **7.2.6**

7.2.6.a This requirement is based on [7.2.6] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **7.3 Closing arrangement, securing devices and stoppers**

#### **7.3.1 General**

7.3.1.a This requirement is based on UR S21.5.1 and [7.3.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **7.3.2 Arrangements**

7.3.2.a This requirement is based on UR S21.5.1 and [7.3.2] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **7.3.3 Spacing**

7.3.3.a This requirement is based on [7.3.3] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **7.3.4 Construction**

7.3.4.a This requirement is based on UR S21.5.1 and [7.3.4] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **7.3.5 Area of securing devices**

7.3.5.a This requirement is based on UR S21.5.1 and [7.3.5] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **7.3.6 Inertia of edges elements**

7.3.6.a This requirement is based on UR S21.5.1 and [7.3.6] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **7.3.7 Diameter of rods or bolts**

7.3.7.a This requirement is based on UR S21.5.1 and [7.3.7] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **7.3.8 Stoppers**

7.3.8.a This requirement is based on UR S21.5.2 and [7.3.8] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **7.4 Tarpaulins**

#### **7.4.1**

7.4.1.a This requirement is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.15 (11)) and based on [7.4.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **7.5 Cleats**

#### **7.5.1**

7.5.1.a This requirement is based on [7.5.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

## **7.5.2**

7.5.2.a This requirement is based on [7.5.2] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

## **7.6 Wedges**

### **7.6.1 Wedges**

7.6.1.a This requirement is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.15 (10)) and based on [7.6.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

## **8. DRAINAGE**

### **8.1 Arrangement**

#### **8.1.1**

8.1.1.a This requirement is based on [8.1.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **8.1.2**

8.1.2.a This requirement is based on [8.1.2] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **8.1.3**

8.1.3.a This requirement is based on [8.1.3] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **8.1.4**

8.1.4.a This requirement is based on [8.1.4] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

8.1.4.b

## **9. SMALL HATCHES FITTED ON THE EXPOSED FORE DECK**

### **9.1 Application**

#### **9.1.1**

9.1.1.a This requirement is based on UR S26.2 and [9.1.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

#### **9.1.2**

9.1.2.a This requirement is based on UR S26.1 and [9.1.2] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

## **9.2 Strength**

### **9.2.1**

9.2.1.a This requirement is based on UR S26.4.1 and [9.2.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **9.2.2**

9.2.2.a This requirement is based on UR S26.4.2 and [9.2.2] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **9.2.3**

9.2.3.a This requirement is based on UR S26.4.3 and [9.2.3] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **9.2.4**

9.2.4.a This requirement is based on UR S26.4.4 and [9.2.4] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

## **9.3 Weathertightness**

### **9.3.1**

9.3.1.a This requirement is based on UR S26.6.1 and [9.3.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

## **9.4 Primary securing devices**

### **9.4.1**

9.4.1.a This requirement is based on UR S26.5 and [9.4.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **9.4.2**

9.4.2.a This requirement is based on UR S26.6.2 and [9.4.2] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **9.4.3**

9.4.3.a This requirement is based on UR S26.6.3 and [9.4.3] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **9.4.4**

9.4.4.a This requirement is based on UR S26.6.4 and [9.4.4] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

### **9.4.5**

9.4.5.a This requirement is based on UR S26.6.5 and [9.4.5] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

## **9.5 Secondary securing devices**

### **9.5.1**

- 9.5.1.a This requirement is based on UR S26.7 and [9.5.1] of Part B, Chapter 9, Section 7 of BV Rules for Steel Ships.

## SECTION 6 – ARRANGEMENT OF HULL AND SUPERSTRUCTURE OPENINGS

### 1. GENERAL

#### 1.1 Application

##### 1.1.1

- 1.1.1.a This regulation is based on the regulations in Section 9, Chapter 9, Part B of the BV Rules. Regulations related to material of glass were corrected with a note to refer to ISO standards.

#### 1.2 Definitions

##### 1.2.1 Standard height of superstructure

- 1.2.1.a This requirement is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.33) and based on [1.2.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

##### 1.2.2 Standard sheer

- 1.2.2.a This requirement is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.38) and based on [1.2.2] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

##### 1.2.3 Exposed zones

- 1.2.3.a This requirement is based on [1.2.3] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

##### 1.2.4 Unexposed zones

- 1.2.4.a This requirement is based on [1.2.4] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### 2. EXTERNAL OPENINGS

#### 2.1 General

##### 2.1.1

- 2.1.1.a This regulation is in accordance with SOLAS Reg.II-1/25-10 .1 and based on [2.1.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

##### 2.1.2

- 2.1.2.a This regulation is in accordance with SOLAS Reg.II-1/25-10 .2 and based on [2.1.2] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

##### 2.1.3

- 2.1.3.a This requirement is based on [2.1.3] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.



#### **2.1.4**

2.1.4.a This regulation is in accordance with SOLAS Reg.II-1/25-10 .5 and based on [2.1.4] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **2.2 Gangway, cargo and coaling ports**

#### **2.2.1**

2.2.1.a This regulation is in accordance with SOLAS Reg.II-1/17-1 & Reg.II-1/17-10.1&10.2 and ILLC, as amended, (Resolution MSC.143(77) Reg.21(2)).

## **3. SIDE SCUTTLES, WINDOWS AND SKYLIGHTS**

### **3.1 General**

#### **3.1.1 Application**

3.1.1.a This requirement is based on [3.1.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

#### **3.1.2 Side scuttle definition**

3.1.2.a This requirement is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.23(2)) and based on [3.1.2] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

#### **3.1.3 Window definition**

3.1.3.a This requirement is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.23(3)) and based on [3.1.3] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

#### **3.1.4 Number of openings in the shell plating**

3.1.4.a This regulation is in accordance with SOLAS Reg.II-1/17-1 & Reg.II-1/17-2 and based on [3.1.4] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

#### **3.1.5 Material and scantlings**

3.1.5.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.23(1)) and based on [3.1.5] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

#### **3.1.6 Means of closing and opening**

3.1.6.a This regulation is in accordance with SOLAS Reg.II-1/17-1 & Reg.II-1/17-2 and based on [3.1.6] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

#### **3.1.7 Opening of side scuttles**

3.1.7.a This regulation is in accordance with SOLAS Reg.II-1/17-1 & Reg.II-1/17-3.2 and based on [3.1.7] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

## **3.2 Opening arrangement**

### **3.2.1 General**

3.2.1.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.23(5)) and based on [3.2.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **3.2.2 Side scuttles below (1.4 + 0.025B)m above the water**

3.2.2.a This regulation is in accordance with SOLAS Reg.II-1/17-1 & Reg.II-1/17-3.3.1 & 3.3.3 and based on [3.2.2] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **3.2.3 Cargo spaces**

3.2.3.a This regulation is in accordance with SOLAS Reg.II-1/17-1 & Reg.II-1/17-6.1 to 6.3 and based on [3.2.3] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **3.2.4 Non-opening type side scuttles**

3.2.4.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.23(6)) and based on [3.2.4] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **3.2.5 Manholes and flush scuttles**

3.2.5.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.18(1)) and based on [3.2.5] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **3.2.6 Automatic ventilating scuttles**

3.2.6.a This regulation is in accordance with SOLAS Reg.II-1/17-1 & Reg.II-1/17-7 and based on [3.2.7] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **3.2.7 Window arrangement**

3.2.7.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.23(7)) and based on [3.2.8] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **3.2.8 Skylights**

3.2.8.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.23(12)) and based on [3.2.9] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

## **3.3 Glasses**

### **3.3.1 General**

3.3.1.a This requirement is based on [3.3.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **3.3.2 Design loads**

3.3.2.a This requirement is based on [3.3.2] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **3.3.3 Materials**

3.3.3.a This requirement is based on [3.3.3] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **3.3.4 Thickness of toughened glasses in side scuttles**

3.3.4.a This requirement is based on [3.3.4] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **3.3.5 Thickness of toughened glasses in rectangular windows**

3.3.5.a This requirement is based on [3.3.5] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

## **3.4 Deadlight arrangement**

### **3.4.1 General**

3.4.1.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.23(4)) and based on [3.4.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **3.4.2 Openings at the side shell in the second tier**

3.4.2.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.23(8)) and based on [3.4.2] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **3.4.3 Openings set inboard in the second tier**

3.4.3.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.23(9) and 23(10)) and based on [3.4.3] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **3.4.4 Deckhouses on superstructures of less than standard height**

3.4.4.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.23(11)) and based on [3.4.4] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **3.4.5 Openings protected by a deckhouse**

3.4.5.a This requirement is based on [3.4.6] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

## **4. DISCHARGES**

### **4.1 Arrangement of discharges**

#### **4.1.1 Inlets and discharges**

4.1.1.a This regulation is in accordance with SOLAS Reg.II-1/17-1 & Reg.II-1/17-9.1 and based on [4.1.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

#### **4.1.2 Inboard opening of ash-shoot, rubbish-shoot, etc.**

4.1.2.a This regulation is in accordance with SOLAS Reg.II-1/17-1 & Reg.II-1/17-11.1 & 11.2 and based on [4.1.2] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **4.2 Arrangement of garbage chutes**

#### **4.2.1 Inboard end above the waterline**

4.2.1.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.22-1(1,b)) and based on [4.2.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

#### **4.2.2 Inboard end below the waterline**

4.2.2.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.22-1(4)) and based on [4.2.2] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

#### **4.2.3 Gate valves**

4.2.3.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.22-1(1,a)) and based on [4.2.3] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

#### **4.2.4 Hinged cover and discharge flap**

4.2.4.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.22-1(1,c)) and based on [4.2.4] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

#### **4.2.5 Making of valve and hinged cover**

4.2.5.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.22-1(3)) and based on [4.2.5] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **4.3 Scantling of garbage chutes**

#### **4.3.1 Material**

4.3.1.a This requirement is based on [4.3.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **4.3.2 Wall thickness**

4.3.2.a This requirement is based on [4.3.2] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

## **5. FREEING PORTS**

### **5.1 General provisions**

#### **5.1.1 General**

5.1.1.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.24 (1,a) & Reg.3 (15)) and based on [5.1.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

#### **5.1.2 Freeing port areas**

5.1.2.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.24) and based on [5.1.2] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

#### **5.1.3 Freeing port arrangement**

5.1.3.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.24 (5)) and based on [5.1.3] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

#### **5.1.4 Freeing port positioning**

5.1.4.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.24 (5) & Reg.24 (6)) and based on [5.1.4] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

#### **5.1.5 Freeing port closures**

5.1.5.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.24 (6)) and based on [5.1.5] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **5.2 Freeing port area in a well not adjacent to a trunk or hatchways**

#### **5.2.1 Freeing port area**

5.2.1.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.24 (1, b & c)) and based on [5.2.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

#### **5.2.2 Minimum freeing port area for a deckhouse having breath not less than 0.8B**

5.2.2.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.24 (1, d)) and based on [5.2.2] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **5.2.3 Minimum freeing port area for screen bulkhead**

- 5.2.3.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.24 (1, e)) and based on [5.2.3] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

## **5.3 Freeing port area in a well contiguous to a trunk or hatchways**

### **5.3.1 Freeing area for continuous trunk or continuous hatchway coaming**

- 5.3.1.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.24 (2)) and based on [5.3.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **5.3.2 Freeing area for non-continuous trunk or hatchway coaming**

- 5.3.2.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.24 (3)) and based on [5.3.2] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

## **5.4 Freeing port area in an open space within superstructures**

### **5.4.1 General**

- 5.4.1.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.24 (4)) and based on [5.4.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **5.4.2 Freeing port area for open superstructures**

- 5.4.2.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.24 (4)) and based on [5.4.2] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **5.4.3 Freeing port area for open well**

- 5.4.3.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.24 (4)) and based on [5.4.3] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

## **5.5 Freeing port area in bulwarks of the freeboard deck for ships of types B-100 and B-60**

### **5.5.1 Freeing arrangement for type B-60**

- 5.5.1.a This requirement is based on [5.5.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **5.5.2 Freeing arrangement for type B-100 ships with trunks**

- 5.5.2.a This requirement is based on [5.5.2] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

## **6. MACHINERY SPACE OPENINGS**

### **6.1 Engine room skylights**

#### **6.1.1**

6.1.1.a This requirement is based on [6.1.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **6.2 Closing devices**

#### **6.2.1 Machinery casings**

6.2.1.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.17 (1) & 12(1)) and based on [6.2.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

#### **6.2.2 Height of the sill of the door**

6.2.2.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.17 (1 & 2)) and based on [6.2.3] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

#### **6.2.3 Double doors**

6.2.3.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.17 (1 & 2)) and based on [6.2.4] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

#### **6.2.4 Fiddly openings**

6.2.4.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.17 (5 )) and based on [6.2.5] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **6.3 Coamings**

#### **6.3.1**

6.3.1.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.17 (3 )) and based on [6.3.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

#### **6.3.2**

6.3.2.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.17 (4 )) and based on [6.3.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

## **7. COMPANIONWAY**

### **7.1 General**

#### **7.1.1 Openings in freeboard deck**

7.1.1.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.18 (2 )) and based on [7.1.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

#### **7.1.2 Openings in superstructures**

7.1.2.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.18 (2 )) and based on [7.1.2] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

#### **7.1.3 Openings superstructures having height less than standard height**

7.1.3.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.18 (3)) and based on [7.1.3] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **7.2 Scantlings**

#### **7.2.1**

7.2.1.a This requirement is based on [7.2.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **7.3 Closing devices**

#### **7.3.1 Doors**

7.3.1.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.18 (2)) and based on [7.3.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

#### **7.3.2 Height of sills**

7.3.2.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.18 (4 to 6)) and based on [7.3.2] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

## **8. VENTILATORS**

### **8.1 Closing appliances**

#### **8.1.1 General**

8.1.1.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.19 (4 )) and based on [8.1.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.



### **8.1.2 Closing appliance exemption**

8.1.2.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.19 (3)) and based on [8.1.2] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **8.1.3 Closing appliances for ships of not more than 100 m in length**

8.1.3.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.19 (4 )) and based on [8.1.3] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **8.1.4 Closing appliances for ships of more than 100 m in length**

8.1.4.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.19 (4 )) and based on [8.1.4] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **8.1.5 Ventilation of machinery spaces and emergency generator room**

8.1.5.a This requirement is based on [8.1.5] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **8.1.6 Reduced height of ventilator coamings for machinery spaces and emergency generator room**

8.1.6.a This requirement is based on [8.1.6] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **8.1.7 Closing arrangements of ventilators led overboard or through enclosed superstructures**

8.1.7.a This requirement is based on [8.1.7] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

## **8.2 Coamings**

### **8.2.1 General**

8.2.1.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.19 (1 & 2)) and based on [8.2.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

### **8.2.2 Scantlings**

8.2.2.a This regulation is in accordance with ILLC, as amended, (Resolution MSC.143(77) Reg.19 (1 & 2)) and based on [8.2.2] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.

## **9. TANK CLEANING OPENINGS**

### **9.1 General**

#### **9.1.1**

- 9.1.1.a This requirement is based on [9.1.1] of Part B, Chapter 9, Section 9 of BV Rules for Steel Ships.