Corrigenda for 2022 Classification Technical Rules

* Please note that this corrigenda is for the printed version of the 202 Classification Technical Rules, and the PDF files posted on the website have been corrected.

PART 1

Present	Correction	Note
〈Rule〉 Pt 1 CHAPTER 1 CLASSIFICATION Section 3 Classificataion Survey during Construction *(2022)* **307. Stability *(2020)*【See Guidance】** 1. 〈omitted〉 2. The preparation and approval of stability booklets in above **Par 1** are to demonstrate that their intact stability is adequate for the service intended. Adequate intact stability means compliance with standards laid down by the relevant Administration or those of the Society taking into account the ship's size and type. The level of intact stability for ships with a length of 24 m and above should not be less than that provided by Part A of IMO Res. MSC.267(85)(Adoption of the international code on intact stability, 2008) as applicable to the type of ship being considered. Where other criteria are accepted by the Administration concerned, these criteria may be used for the purpose of classification. Evidence of approval by the Administration concerned may be accepted for the purpose of classification. *(2020)* 3. Where an loading instrument having a stability computation capability as supplemental use of stability information booklet specified in **Par 1** is provided, the test report of representative operational conditions is to be submitted to the Society, and the loading instrument shall cover all stability requirements applicable to the ship such as intact, damage and grain stability, etc. When the stability information include sufficient loading conditions of the ship, some part of the function may be omitted. The instrument is to be confirmed by the Surveyor upon installation in accordance with the test report approved by the Society. Where a loading instrument is installed onboard, the approval and survey procedures are given in **Annex 1-10** of the Guidance. *(2020)*	〈Rule〉 Pt 1 CHAPTER 1 CLASSIFICATION Section 3 Classificataion Survey during Construction *(2022)* **307. Stability *(2020)*【See Guidance】** 1. 〈omitted〉 2. The preparation and approval of stability booklets in above **Par 1** are to demonstrate that their intact stability is adequate for the service intended. Adequate intact stability means compliance with standards laid down by the relevant Administration or those of the Society taking into account the ship's size and type. The level of intact stability for ships with a length of 24 m and above should not be less than that provided by Part A of IMO Res. MSC.267(85)(Adoption of the international code on intact stability, 2008) as applicable to the type of ship being considered. Where other criteria are accepted by the Administration concerned, these criteria may be used for the purpose of classification. Evidence of approval by the Administration concerned may be accepted for the purpose of classification. *(2020)* 3. Where an loading instrument having a stability computation capability as supplemental use of stability information booklet specified in **Par 1** is provided, the test report of representative operational conditions is to be submitted to the Society, and the loading instrument shall cover all stability requirements applicable to the ship such as intact, damage and grain stability, etc. When the stability information include sufficient loading conditions of the ship, some part of the function may be omitted. The instrument is to be confirmed by the Surveyor upon installation in accordance with the test report approved by the Society. Where a loading instrument is installed onboard, the approval and survey procedures are given in **Annex 1-10** of the Guidance. *(2021)* ~~*(2020)*~~	

Present	Correction	Note
# CHAPTER 3 HULL SURVEYS OF SHIPS SUBJECT TO THE ENHANCED SURVEY PROGRAMME ## Section 2 Bulk Carriers **202. Annual Survey** **3. Examination of weather decks, hatch covers and coamings** (4) Where the cargo hatch securing system does not function properly, repairs are to be carried out under the supervision of the Society. Where hatch covers or coamings undergo substantial repairs, the strength of securing devices should be upgraded to comply with Rules **Pt 7, Ch 3, Sec 9, 905.** "Securing arrangements". *(2019)* 【See Guidance】 ## Section 6 Double Skin Bulk Carriers **602. Annual Survey** **3. Examination of weather deck, hatch covers and coamings** (4) Where the cargo hatch securing system does not function properly, repairs are to be carried out under the supervision of the Society. Where hatch covers or coamings undergo substantial repairs, the strength of securing devices should be upgraded to comply with Rules **Pt 7, Ch 3, Sec 9, 905.** "Securing arrangements". *(2019)* 【See Guidance】	# CHAPTER 3 HULL SURVEYS OF SHIPS SUBJECT TO THE ENHANCED SURVEY PROGRAMME ## Section 2 Bulk Carriers **202. Annual Survey** **3. Examination of weather decks, hatch covers and coamings** (4) Where the cargo hatch securing system does not function properly, repairs are to be carried out under the supervision of the Society. Where hatch covers or coamings undergo substantial repairs, the strength of securing devices should be upgraded to comply with Rules **Pt 7, Ch 3, Sec 9, 905.** "Securing arrangements". *(2019)* ~~【See Guidance】~~ ## Section 6 Double Skin Bulk Carriers **602. Annual Survey** **3. Examination of weather deck, hatch covers and coamings** (4) Where the cargo hatch securing system does not function properly, repairs are to be carried out under the supervision of the Society. Where hatch covers or coamings undergo substantial repairs, the strength of securing devices should be upgraded to comply with Rules **Pt 7, Ch 3, Sec 9, 905.** "Securing arrangements". *(2019)* ~~【See Guidance】~~	

Present	Correction	Note
〈Rule〉 Pt 1 **CHAPTER 2 PERIODICAL AND OTHER SURVEYS** **Section 1 General** **101. Definitions** The definitions of terms used in **Ch 2** and **Ch 3** are to be as specified in the followings, unless otherwise specified elsewhere. **1. ~ 6. 〈omitted〉** 7. **General dray cargo ship** means carrying soild cargoes. For more details, refer to 1. (1) of **1501.** *(2022)* 〈omitted〉 **111. Thickness measurements Acceptance Criteria** ***(2019)*** The acceptance criteria for thickness measurements are according to the Rules of the individual Classification Society and/or specific IACS URs depending on ship's age and structural elements concerned, e.g. UR S21A(UR S21A applies for ships contracted for construction on or after 1 July 2012, Rev.1 of UR S21A applies for ships contracted for construction on or after 1 July 2016.) for all cargo hatch covers and coamings on exposed decks	**〈Rule〉 Pt 1** **CHAPTER 2 PERIODICAL AND OTHER SURVEYS** **Section 1 General** **101. Definitions** The definitions of terms used in **Ch 2** and **Ch 3** are to be as specified in the followings, unless otherwise specified elsewhere. **1. ~ 6. 〈same as the current Rules〉** 7. **General dry dray cargo ship** means carrying soild cargoes. For more details, refer to 1. (1) of **1501.** *(2022)* 〈same as the current Rules〉 **111. Thickness measurements Acceptance Criteria** ***(2019)*** The acceptance criteria for thickness measurements are according to Annex 1-5, Table 1 ~~the Rules of the individual Classification Society~~ and/or specific IACS URs depending on ship's age and structural elements concerned, e.g. UR S21A(UR S21A applies for ships contracted for construction on or after 1 July 2012, Rev.1 of UR S21A applies for ships contracted for construction on or after 1 July 2016.) for all cargo hatch covers and coamings on exposed decks	- Typo (English only) - In line with Koran version. (English only)

Present	Correction	Note

〈Guidance〉 Pt 1

Annex 1-16 Procedures for Testing Tanks and Tight Boundaries *(2018)*

PART A - SOLAS Ships

1. 〈omitted〉

2. Application

(1) 〈omitted〉

(2) The testing of cargo containment systems of liquefied gas carriers is to be in accordance with the testing requirements in 4.20 to 4.26 of **Pt 7 Ch 5** of the Rules deemed appropriate by the Society.

(3) 〈omitted〉

3. 〈omitted〉

4. Test Procedures

Table 3.1.2 Additional Test Requirements for Special Service Ships/Tanks

	Type of ship/tank	Structures to be tested	Type of test	Test head or pressure	Remarks
1	Liquefied gas carriers	Integral tanks	Leak and structural	See Pt 7 Ch 5 Sec. 4 421. to 426.	-
		Hull structure supporting membrane or semi-membrane tanks			
		Independent tanks type A			
		Independent tanks type B			
		Independent tanks type C			
〈omitted〉					

Note: 〈omitted〉

〈Guidance〉 Pt 1

Annex 1-16 Procedures for Testing Tanks and Tight Boundaries *(2018)*

PART A - SOLAS Ships

1. 〈omitted〉

2. Application

(1) 〈omitted〉

(2) The testing of cargo containment systems of liquefied gas carriers is to be in accordance with the testing requirements in 420 ~~4.20~~ to 426 ~~4.26~~ of **Pt 7 Ch 5** of the Rules deemed appropriate by the Society.

(3) 〈omitted〉

3. 〈omitted〉

4. Test Procedures

Table 3.1.2 Additional Test Requirements for Special Service Ships/Tanks

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1	Liquefied gas carriers	Integral tanks	Leak and structural	See Pt 7 Ch 5 ~~Sec. 4~~ 420. ~~421.~~ to 426.	-
		Hull structure supporting membrane or semi-membrane tanks			
		Independent tanks type A			
		Independent tanks type B			
		Independent tanks type C			
〈same as current Guidance〉					

Note: 〈same as the current Guidance〉

- Typo (English only)
- Typo

Present	Correction	비고
〈Rule〉 Pt 1 **CHAPTER 2 PERIODICAL AND OTHER SURVEYS** **Section 4 Special Survey (Hull, Equipment and Fire-extinguishing Appliances)** **403. Requirements of survey (2018)** 1. 〈omitted〉 (1) ~ (6) 〈omitted〉 (7) Internal examination of spaces *(2020)* (a) ~ (c) 〈omitted〉 (d) When such breakdown of hard protective coating is found in double bottom ballast tanks and it is not renewed, where a soft or semi-hard coating has been applied, or where a hard protective coating was not applied from the time of construction, the tanks in question may be examined at annual intervals. When considered necessary be the Surveyor, or where extensive corrosion exists, thickness measurements are to be carried out. **【See Guidance】**	**〈Rule〉 Pt 1** **CHAPTER 2 PERIODICAL AND OTHER SURVEYS** **Section 4 Special Survey (Hull, Equipment and Fire-extinguishing Appliances)** **403. Requirements of survey (2018)** 1. 〈omitted〉 (1) ~ (6) 〈omitted〉 (7) Internal examination of spaces *(2020)* (a) ~ (c) 〈omitted〉 (d) When such breakdown of hard protective coating is found in double bottom ballast tanks and it is not renewed, where a soft or semi-hard coating has been applied, or where a hard protective coating was not applied from the time of construction, the tanks in question may be examined at annual intervals. When considered necessary by the Surveyor, or where extensive corrosion exists, thickness measurements are to be carried out. **【See Guidance】**	- Typo (English only)
Section 15 Hull Surveys for General Dry Cargo Ships **1504. Special Survey** **1. General 〈omitted〉** **2. Tank protection** (1) Where provided, the condition of the corrosion prevention system of ballast tanks is to be examined. For ballast tanks, excluding double bottom ballast tanks, where a hard protective coating is found in POOR condition and it is not renewed, where a soft or semi-hard coating has been applied, or where a hard protective coating was not applied from the time of construction, the tanks in question are to be examined at annual intervals. Thickness measurements are to be carried out as deemed necessary be the Surveyor. **【See Guidance】**	**Section 15 Hull Surveys for General Dry Cargo Ships** **1504. Special Survey** **1. General 〈omitted〉** **2. Tank protection** (1) Where provided, the condition of the corrosion prevention system of ballast tanks is to be examined. For ballast tanks, excluding double bottom ballast tanks, where a hard protective coating is found in POOR condition and it is not renewed, where a soft or semi-hard coating has been applied, or where a hard protective coating was not applied from the time of construction, the tanks in question are to be examined at annual intervals. Thickness measurements are to be carried out as deemed necessary by the Surveyor. **【See Guidance】**	- Typo (English only)

Present	Correction	비고
Section 16 Hull Surveys for Liquefied Gas Carriers	**Section 16 Hull Surveys for Liquefied Gas Carriers**	
1604. Special Survey	**1604. Special Survey**	
1. General 〈omitted〉	**1. General** 〈omitted〉	
2. Tank protection	**2. Tank protection**	
(1) Where provided, the condition of the corrosion prevention system of ballast tanks is to be examined. For ballast tanks, excluding double bottom ballast tanks, where a hard protective coating is found in POOR condition and it is not renewed, where a soft or semi-hard coating has been applied, or where a hard protective coating was not applied from the time of construction, the tanks in question are to be examined at annual intervals. Thickness measurements are to be carried out as deemed necessary be the Surveyor. **【See Guidance】**	(1) Where provided, the condition of the corrosion prevention system of ballast tanks is to be examined. For ballast tanks, excluding double bottom ballast tanks, where a hard protective coating is found in POOR condition and it is not renewed, where a soft or semi-hard coating has been applied, or where a hard protective coating was not applied from the time of construction, the tanks in question are to be examined at annual intervals. Thickness measurements are to be carried out as deemed necessary by the Surveyor. **【See Guidance】**	– Typo (English only)
CHAPTER 3 HULL SURVEYS OF SHIPS SUBJECT TO THE ENHANCED SURVEY PROGRAMME	**CHAPTER 3 HULL SURVEYS OF SHIPS SUBJECT TO THE ENHANCED SURVEY PROGRAMME**	
Section 6 Double Skin Bulk Carriers	**Section 6 Double Skin Bulk Carriers**	
604. Special Survey	**604. Special Survey**	
Table 1.3.13 Minimum requirements for Close-up Survey at Special Survey for Double Skin Bulk Carriers 【See Guidance】	**Table 1.3.13 Minimum requirements for Close-up Survey at Special Survey for Double Skin Bulk Carriers ~~【See Guidance】~~**	– Typo (English only)
1) Excluding ore carriers	1) Excluding ore carriers	

Present	Correction	Remarks
〈Guidance〉 Pt 1 CHAPTER 2 PERIODICAL AND OTHER SURVEYS Section 1 General *(2021)* **101. Definitions** 【See Rule】 In application to **101.** 11 of the Rules, the term "location prone to rapid wastage" means one of the following cases among the location specified in **Annex 1-5, Table 2** of the Guidance: (1) Area with standing bilges (2) Bulkheads facing fuel oil tanks being heated	〈Guidance〉 Pt 1 CHAPTER 2 PERIODICAL AND OTHER SURVEYS Section 1 General *(2021)* **101. Definitions** 【See Rule】 In application to **101.** 13 of the Rules, the term "location prone to rapid wastage" means one of the following cases among the location specified in **Annex 1-5, Table 2** of the Guidance: (1) Area with standing bilges (2) Bulkheads facing fuel oil tanks being heated	- Typo

Present	Correction	Note
〈Rule〉 Pt 1 **CHAPTER 1 CLASSIFICATION** **Section 1 General** **101. Definitions** ***(2020)*** The definitions of terms used in **Ch 1, Ch 2** and **Ch 3** are to be as specified in the following, unless otherwise specified elsewhere. **1. Classification** means recording the name and relevant data of a ship which has been satisfactorily surveyed in accordance with this Society's Rules and approved by the Classification Committed, on the computer register. 〈omitted〉 **Section 2 Character of Classification** **201. Class notations 【See Guidance】** The class notations assigned to the ships classed with the Society are to be in accordance with the followings: 〈hereinafter, omited〉	**〈Rule〉 Pt 1** **CHAPTER 1 CLASSIFICATION** **Section 1 General** **101. Definitions** ***(2020)*** The definitions of terms used in **Ch 1, Ch 2** and **Ch 3** are to be as specified in the following, unless otherwise specified elsewhere. **1. Classification** means recording the name and relevant data of a ship which has been satisfactorily surveyed in accordance with this Society's Rules and approved by the Classification Committee, on the computer register. 〈same as the current Rules〉 **Section 2 Class Notations ~~Character of Classification~~** **201. Class notations 【See Guidance】** The class notations assigned to the ships classed with the Society are to be in accordance with the followings: 〈hereinafter, same as the current Rules〉	– Typo (English only) – Clarified meaning. (English only)

Present	Correction	Note
# CHAPTER 2 PERIODICAL AND OTHER SURVEYS ## Section 15 Hull Surveys for General Dry Cargo Ships **1504. Special Survey** **5. Extent of thickness measurement** ***(2017)*** (1) The minimum requirements for thickness measurements at Special Survey are given in **Table 1.2.9.** (2) The Surveyor may extend the thickness measurements as deemed necessary. When thickness measurements is to be increased to determine the extent of thickness measurements is to be increased to determine the extent of areas of substantial corrosion. **Table 1.2.5** may be sued as guidance for these additional thickness measurements. *(2017)* **【See Guidance】** 〈hereinafter, omited〉	# CHAPTER 2 PERIODICAL AND OTHER SURVEYS ## Section 15 Hull Surveys for General Dry Cargo Ships **1504. Special Survey** **5. Extent of thickness measurement** ***(2017)*** (1) The minimum requirements for thickness measurements at Special Survey are given in **Table 1.2.9.** (2) The Surveyor may extend the thickness measurements as deemed necessary. When thickness measurements is to be increased to determine the extent of thickness measurements is to be increased to determine the extent of areas of substantial corrosion. **Table 1.2.5** may be used ~~sued~~ as guidance for these additional thickness measurements. *(2017)* **【See Guidance】** 〈hereinafter, same as the current Rules〉	- Typo (English only)

Present	Correction	Note
〈Guidance〉 Pt 1 CHAPTER 1 CLASSIFICATION Section 2 Character of Classification **201. Class notations *(2021)* 【See Rule】** **1.** The definitions of terms specified in **201.** (2) to (4) of the Rules are as follows. If the following definition are expressly provided by the flag administration, they are to follow the provided definition. (A) Coastal service area : Water area within 20 Nautical miles(1 Nautical mile = 1852 m) of the shore (B) Smooth water service area : Water area within lakes, rivers and harbours 〈omitted〉 Annex 1-1 Character of Classification 1. Class Notation **1.1 Ship Type and Special Feature Notations** **〈hereinafter, omitted〉**	〈Guidance〉 Pt 1 CHAPTER 1 CLASSIFICATION Section 2 Class Notations ~~Character of Classification~~ **201. Class notations *(2021)* 【See Rule】** **1.** The definitions of terms specified in **201.** (2) to (4) of the Rules are as follows. If the following definition are expressly provided by the flag administration, they are to follow the provided definition. (A) Coastal service area : Water area within 20 Nautical miles(1 Nautical mile = 1852 m) of the shore (B) Smooth water service area : Water area within lakes, rivers and harbours 〈same as the current Guidances〉 Annex 1-1 Class Notations ~~Character of Classification~~ 1. Class Notations **1.1 Ship Type and Special Feature Notations** **〈hereinafter, same as the current Guidances〉**	- Clarified meaning. (English only)

Present

Annex 1-5 Thickness Measurement Method for Hull Structural Members

Table 15 Requirements for extent of thickness measurements at those areas of substantial corrosion - Oil Tankers, Ore/Oil Ships, Etc. with ESP notation

1) Bottom Structure

Structural Member	Extent of Measurement	Pattern of Measurement
1. Bottom Plating	Minimum of 3 bays across tank including aft bay Measurements around and under all bell mouths	5 point pattern for each panel between longitudinals and webs
〈omitted〉		

Correction

Annex 1-5 Thickness Measurement Method for Hull Structural Members

Table 15 Requirements for extent of thickness measurements at those areas of substantial corrosion - Oil Tankers, Ore/Oil Ships, Etc. with ESP notation

1) Bottom Structure

Structural Member	Extent of Measurement	Pattern of Measurement
1. Bottom Plating	Minimum of 3 bays across tank including aft bay. Measurements around and under all bell mouths	5 point pattern for each panel between longitudinals and webs
〈same as the current Guidances〉		

Note

- Typo(English only)

- Typo
  (Comma deleted)
  (English only)

Present	Correction	Note
3) Side Shell and Longitudinal Bulkheads <table><tr><th>Structural Member</th><th>Extent of Measurement</th><th>Pattern of Measurement</th></tr><tr><td colspan="3">〈omitted〉</td></tr><tr><td>5. Longitudinals – Bracket</td><td>Minimum of three at top middle and bottom of tank in same 3 bays</td><td>5 point pattern over area of bracket</td></tr><tr><td colspan="3">〈omitted〉</td></tr></table>	3) Side Shell and Longitudinal Bulkheads <table><tr><th>Structural Member</th><th>Extent of Measurement</th><th>Pattern of Measurement</th></tr><tr><td colspan="3">〈same as the current Guidances〉</td></tr><tr><td>5. Longitudinals – Bracket</td><td>Minimum of three at top, middle and bottom of tank in same 3 bays</td><td>5 point pattern over area of bracket</td></tr><tr><td colspan="3">〈same as the current Guidances〉</td></tr></table>	– Typo (Comma inserted) (English only)
4) Transverse Bulkheads and Swash Bulkheads <table><tr><th>Structural Member</th><th>Extent of Measurement</th><th>Pattern of Measurement</th></tr><tr><td colspan="3">〈omitted〉</td></tr><tr><td>5. Brackets</td><td>Minimum of three at top middle and bottom of tank</td><td>5 point pattern over areas of bracket</td></tr><tr><td colspan="3">〈omitted〉</td></tr></table>	4) Transverse Bulkheads and Swash Bulkheads <table><tr><th>Structural Member</th><th>Extent of Measurement</th><th>Pattern of Measurement</th></tr><tr><td colspan="3">〈same as the current Guidances〉</td></tr><tr><td>5. Brackets</td><td>Minimum of three at top, middle and bottom of tank</td><td>5 point pattern over areas of bracket</td></tr><tr><td colspan="3">〈same as the current Guidances〉</td></tr></table>	– Typo (Comma deleted) (English only)

Present

Table 17 Requirements for extent of thickness measurements at those areas of substantial corrosion – Double Hull Oil Tankers with ESP notation

1) Bottom, Inner Bottom and Hopper Structure

Structural Member	Extent of Measurement	Pattern of Measurement
〈omitted〉		
6. Hopper Structure Transverse Watertight Bulkhead or Swash Bulkhead	· Lower 1/3 of bulkhead	· 5-point pattern over two square metre of plating
	· Upper 2/3 of bulkhead	· 5-point pattern over two square metre of plating
	〈omitted〉	
7. Panel Stiffening	Where applicable	Single measurements

5) Transverse Watertight and Swash Bulkheads in Cargo Tanks

Structural Member	Extent of Measurement	Pattern of Measurement
1. Upper and Lower Stool, where fitted	· Transverse band within 25 mm of welded connection to inner bottom/deck plating · Transverse band within 25 mm of welded connection to shelf plate	5-point pattern between stiffeners over metre length
〈omitted〉		

Correction

Table 17 Requirements for extent of thickness measurements at those areas of substantial corrosion – Double Hull Oil Tankers with ESP notation

1) Bottom, Inner Bottom and Hopper Structure

Structural Member	Extent of Measurement	Pattern of Measurement
〈same as the current Guidances〉		
6. Hopper Structure Transverse Watertight Bulkhead or Swash Bulkhead	· Lower 1/3 of bulkhead	· 5-point pattern over one ~~two~~ square metre of plating
	· Upper 2/3 of bulkhead	· 5-point pattern over two square metre of plating
	〈same as the current Guidances〉	
7. Panel Stiffening	Where applicable	Single measurements

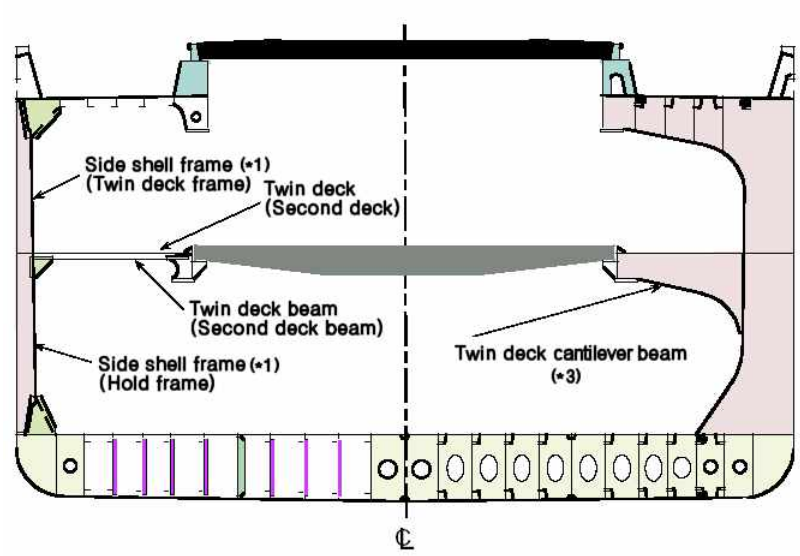
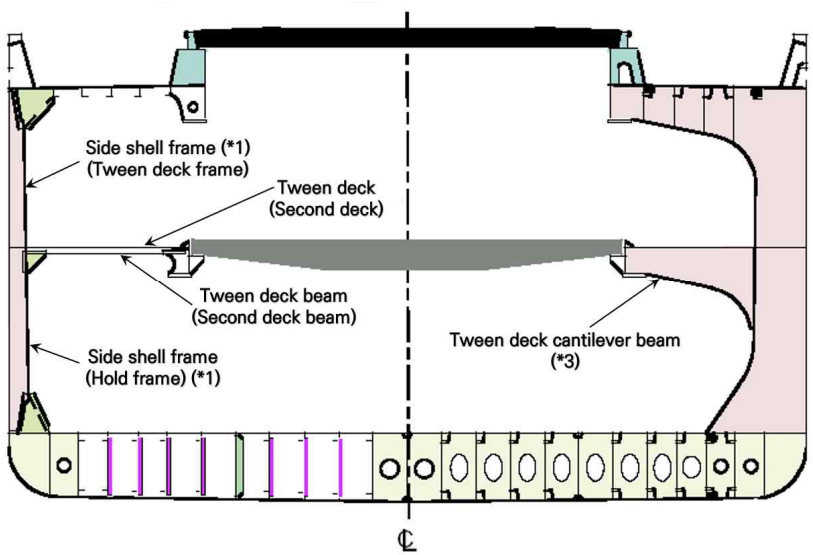
5) Transverse Watertight and Swash Bulkheads in Cargo Tanks

Structural Member	Extent of Measurement	Pattern of Measurement
1. Upper and Lower Stool, where fitted	· Transverse band within 25 mm of welded connection to inner bottom/deck plating · Transverse band within 25 mm of welded connection to shelf plate	5-point pattern between stiffeners over one metre length
〈same as the current Guidances〉		

Note

– Typo (English only)

– Typo (English only)

Present	Correction	Reason
〈Guidance Pt 1〉 **Annex 1-6 Areas of Close-up Survey, etc.** **1.** Guidance for areas of Close-up Survey for General Dry Cargo Ships, Bulk Carriers, Oil Tankers, Chemical Tankers, Double Hul Oil Tankers and Double Skin Bulk Carriers specified in **Table 1.2.8, Table 1.3.1, Table 1.3.4**, **Table 1.3.7, Table 1.3.10** and **Table 1.3.13** of the Rules are indicated on the diagrams as follows. (1) Areas of Close-up Survey for General Dry Cargo Ships **〈figure omitted〉**  Note : (*1) through (*6) are as given in **Table 1.2.8** of the Rules	〈Guidance Pt 1〉 **Annex 1-6 Areas of Close-up Survey, etc.** **1.** Guidance for areas of Close-up Survey for General Dry Cargo Ships, Bulk Carriers, Oil Tankers, Chemical Tankers, Double Hul Oil Tankers and Double Skin Bulk Carriers specified in **Table 1.2.8, Table 1.3.1, Table 1.3.4**, **Table 1.3.7, Table 1.3.10** and **Table 1.3.13** of the Rules are indicated on the diagrams as follows. (1) Areas of Close-up Survey for General Dry Cargo Ships **〈figure same as the current Guidances〉**  Note : (*1) through (*6) are as given in **Table 1.2.8** of the Rules	- Typo **Twin** is corrected to **Tween**

<table>
<tr><th>Present</th><th>Correction</th><th>Reason</th></tr>
<tr>
<td>

Annex 1-12 Hull Survey for Classification Survey during Construction

Appendix 1-12-1 Shipyard Review Record

Name of Shipyard	Date

1. Details of any management systems

Obtained Approval	Certified by	Expiry Date	Remarks (scope, etc.)
ISO-9001			
ISO 14001			
ISO 18001			
Other:			

</td>
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Annex 1-12 Hull Survey for Classification Survey during Construction

Appendix 1-12-1 Shipyard Review Record

Name of Shipyard	Date

1. Details of any management systems

Obtained Approval	Certified by	Expiry Date	Remarks (scope, etc.)
ISO-9001			
ISO 14001			
ISO ~~18001~~ 45001			
Other:			

</td>
<td>

- For reflection of IACS UR Z23 (Rev.7 Corr. 1 Oct 2022)

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</table>

Present

Annex 1-1 Class Notations

1. Class Notations

1.1 Ship Type and Special Feature Notations

Ship Types	Special Feature Notations	Remarks
8-3. Oil/Liquefied Gas Carrier *(2022)* 'ESP'(17-3) (Double Hull) (DoubleHull)(EXP) (FAC) (FAO) (FBC) (CSR)	Special Feature Notations given in row 1 and row 2-1	(17-3) : In case of a combined vessel(double hull oil tanker / liquefied gas carrier) with an independent tank in hull, the independent tank is surveyed according to the requirements of the liquefied gas carrier, and only for the cargo area with integrated tank is aurveyed according to the the requirements of double hull oil tanker,

Correction

Annex 1-1 Class Notations

1. Class Notations

1.1 Ship Type and Special Feature Notations

Ship Types	Special Feature Notations	Remarks
8-3. Oil/Liquefied Gas Carrier *(2022)* 'ESP'(17-3) (Double Hull) (DoubleHull)(EXP) (FAC) (FAO) (FBC) (CSR)	Special Feature Notations given in row 1 and row 2-1	(17-3) : In case of a combined vessel(double hull oil tanker / liquefied gas carrier) with an independent tank in hull, the independent tank is surveyed according to the requirements of the liquefied gas carrier, and only for the cargo area with integrated tank is surveyed ~~aurveyed~~ according to the ~~the~~ requirements of double hull oil tanker,

Remarks

- Typo
  (English only)

Present	Correction	Remarks
Annex 1-3 Example of the Survey Programme and the Survey Planning Questionnaire	**Annex 1-3 Example of the Survey Programme and the Survey Planning Questionnaire**	- Typo
Table 2 Example of the Survey Planning Questionnaire	**Table 2 Example of the Survey Planning Questionnaire**	
SURVEY PLANNING QUESTIONNAIRE	SURVEY PLANNING QUESTIONNAIRE	
1. Information on access provisions for Close-up Surveys and thickness measurement	1. Information on access provisions for Close-up Surveys and thickness measurement	
<omitted>	<omitted>	
History of bulk cargoes of a corrosive nature(e.g. high sulphur content) / History of cargo with H_2S content or heated cargo for the last 3 years together with indication as to whether cargo was heated and, where available, Marine Safety Data Sheets(MSDS)*	History of bulk cargoes of a corrosive nature(e.g. high sulphur content) / History of cargo with H_2S content or heated cargo for the last 3 years together with indication as to whether cargo was heated and, where available, Marine Safety Data Sheets(MSDS)*	
* Refer to resolution MSC.150(70) on Recommendation for material safety data sheets for MARPOL Annex I cargoes and marine fuel oils.	* Refer to resolution MSC.150(77) on Recommendation for material safety data sheets for MARPOL Annex I cargoes and marine fuel oils.	

Present	Amendment	Note

〈Rule〉 Pt 1

Annex 1-1 Character of Classification

1. Class Notation

Additional Special Feature Notations	Relevant Requirements
LFFS (DF-LNG, SF-LNG)	to ships comply with the requirements of the **Rules and Guidance for the Classification of Ships Using Low-flashpoint Fuels** in which engines using low-flashpoint fuel are installed, other than ships carrying gas in bulk. (Low-Flashpoint Fuel Ship) DF-LNG: Dual fuel engines using LNG as fuel are installed SF-LNG: Single fuel engines using LNG as fuel are installed

〈Rule〉 Pt 1

Annex 1-1 Character of Classification

1. Class Notation

Additional Special Feature Notations	Relevant Requirements
LFFS (DF-LNG, SF-LNG) (DF-Methanol, SF-Methanol) (DF-Ethanol, SF-Ethanol)	to ships comply with the requirements of the **Rules and Guidance for the Classification of Ships Using Low-flashpoint Fuels** in which engines using low-flashpoint fuel are installed, other than ships carrying gas in bulk. (Low-Flashpoint Fuel Ship) DF-LNG: Dual fuel engines using LNG as fuel are installed SF-LNG: Single fuel engines using LNG as fuel are installed DF-Methanol: Dual fuel engines using methyl alcohol as fuel are installed SF-Methanol: Single fuel engines using methyl alcohol as fuel are installed DF-Ethanol: Dual fuel engines using ethyl alcohol as fuel are installed SF-Ethanol: Single fuel engines using ethyl alcohol as fuel are installed

PART 2

Present	Amendment	Note
〈Rules〉 Pt 2 CHAPTER 1 MATERIALS 304. Rolled steels for low temperature service 10. Marking Steels which have satisfactorily complied with the required tests are to be marked with the identification mark in accordance with the requirements in **110.** For steels to which the requirements given in Notes (1) of **Table 2.1.17** and Notes (7) of **Table 2.1.17-1** have been applied, "*TM*" and impact test temperature "*T*" are to be suffixed to the markings. (e.g. *RL* 33*TM*-50*T*)	〈Rules〉 Pt 2 CHAPTER 1 MATERIALS 304. Rolled steels for low temperature service 10. Marking Steels which have satisfactorily complied with the required tests are to be marked with the identification mark in accordance with the requirements in **110.** For steels to which the requirements given in Notes (2) of **Table 2.1.17** and Notes (6) of **Table 2.1.18** have been applied, "*TM*" and impact test temperature "*T*" are to be suffixed to the markings. (e.g. *RL* 33*TM*-50*T*)	

Present

〈Guidance〉 Pt 2

Annex 2-7 Guidance for non-destructive testing of ship hull steel welds

5. Radiographic Testing(RT)

(1) **Methods of radiography**

(A) RT shall be carried out in accordance to *ISO 17636-1:2013* or an accepted recognized standard by the Society *(2021)*

7. Acceptance Levels(criteria) ***(2021)***

(4) **Acceptance Levels**

(F) **Radiographic testing(RT)**

Table 9 Radiographic Testing

Quality Levels (ISO 5817:2014 applies)(1)	Testing Techniques/ levels (ISO 17636-1:2013 applies)(1)	Acceptance levels (ISO 10675-1:2016 applies)(1)
B	B(class)	1
C	B(2)(class)	2
D	**At least A (class)**	3

Note:

(1) Or any recognized standard agreed with the Society and demonstrated to be acceptable

(2) For circumferential weld testing, the minimum number of exposures may correspond to the requirements of ISO 17636-1:2013, class A

Amendment

〈Guidance〉 Pt 2

Annex 2-7 Guidance for non-destructive testing of ship hull steel welds

5. Radiographic Testing(RT)

(1) **Methods of radiography**

(A) RT shall be carried out in accordance to *ISO 17636-1:2022* or an accepted recognized standard by the Society *(2021) (2023)*

7. Acceptance Levels(criteria) ***(2021)***

(4) **Acceptance Levels**

(F) **Radiographic testing(RT)**

Table 9 Radiographic Testing ***(2023)***

Quality Levels (ISO 5817:2014 applies)(1)	Testing Techniques/ levels (ISO 17636-1:2022 applies)(1)	Acceptance levels (ISO 10675-1:2021 applies)(1)
B	B(class)	1
C	B(2)(class)	2
D	**At least A (class)**	3

Note:

(1) Or any recognized standard agreed with the Society and demonstrated to be acceptable

(2) For circumferential weld testing, the minimum number of exposures may correspond to the requirements of ISO 17636-1:2022, class A

Note

일자: 2023.03.08.
조치담당: 최대곤 수석

Responding to 2022 EMSA audit

Responding to 2022 EMSA audit

Present	Amendment	Note
〈Guidance〉 Pt 2 Annex 2-9 Offshore mooring chain 3. Rolled steel bars (7) **Surface inspection, non-destructive inspection and verification of dimensions** (A) Non-destructive examination is to be performed in accordance with recognized standards such as those indicated below or equivalent. Non-destructive examination procedures, together with rejection/acceptance criteria are to be submitted to the Society. *(2017)* (a) Magnetic particle testing(MT) of bars : *ASTM E1444* and *ISO 9934* (b) Magnetic Leakage Flux Testing(MLFT) : *JIS Z2319* (c) Eddy current testing(ET) of bars : *ISO 15549*	〈Guidance〉 Pt 2 Annex 2-9 Offshore mooring chain 3. Rolled steel bars (7) **Surface inspection, non-destructive inspection and verification of dimensions** (A) Non-destructive examination is to be performed in accordance with recognized standards such as those indicated below or equivalent. Non-destructive examination procedures, together with rejection/acceptance criteria are to be submitted to the Society. *(2017)* (a) Magnetic particle testing(MT) of bars : *ASTM E1444* and *ISO 9934* (b) Magnetic Leakage Flux Testing(MLFT) : *JIS Z2319* (c) Eddy current testing(ET) of bars : *ISO 15549:2019 (2023)*	일자: 2023.03.08. 조치담당: 최대곤 수석 Responding to 2022 EMSA audit

Present

〈Guidance〉 Pt 2

Annex 2-12 Guidance for advanced non-destructive testing of materials and welds *(2021)*

8. Testing requirements

(2) **PAUT**

PAUT shall be carried out according to procedures based on *ISO 13588:2019*, *ISO 18563-1:2015*, *ISO 18563-2:2017*, *ISO 18563-3:2015* and *ISO 19285:2017* or recognized standards and the specific requirements of the Society.

(3) **TOFD**

TOFD shall be carried out according to procedure based on *ISO 10863:2011*, and *ISO 15626:2018* or recognized standards and the specific requirements of the Society.

9. Acceptance Levels

(4) **RT-D**

The relationship between acceptance levels, testing levels and quality levels is given in **Table 8**. Quality levels and acceptance levels for Digital Radiography of welds shall be in accordance with *ISO 10675* or standard agreed with the Society.

Table 8 Acceptance levels for RT-D

Quality levels according to ISO 5817:2014 or ISO 10042:2018	Testing techniques/level(class) according to ISO 17636-2:2013	Acceptance level according to ISO 10675-1:2016 & ISO 10675-2:2017
B(Stringent)	B (class)	1
C(Intermediate)	B(1) (class)	2
D(Moderate)	A (class)	3

Notes
(1) For circumferential weld testing, the minimum number of exposures may correspond to the requirements of ISO 17636-2:2013, class A

Amendment

〈Guidance〉 Pt 2

Annex 2-12 Guidance for advanced non-destructive testing of materials and welds *(2021)*

8. Testing requirements

(2) **PAUT**

PAUT shall be carried out according to procedures based on *ISO 13588:2019*, *ISO 18563-1:2022*, *ISO 18563-2:2017*, *ISO 18563-3:2015* and *ISO 19285:2017* or recognized standards and the specific requirements of the Society. *(2023)*

(3) **TOFD**

TOFD shall be carried out according to procedure based on *ISO 10863:2020*, and *ISO 15626:2018* or recognized standards and the specific requirements of the Society. *(2023)*

9. Acceptance Levels

(4) **RT-D**

The relationship between acceptance levels, testing levels and quality levels is given in **Table 8**. Quality levels and acceptance levels for Digital Radiography of welds shall be in accordance with *ISO 10675* or standard agreed with the Society.

Table 8 Acceptance levels for RT-D *(2023)*

Quality levels according to ISO 5817:2014 or ISO 10042:2018	Testing techniques/level(class) according to ISO 17636-2:2013	Acceptance level according to ISO 10675-1:2021 & ISO 10675-2:2017
B(Stringent)	B (class)	1
C(Intermediate)	B(1) (class)	2
D(Moderate)	A (class)	3

Notes
(1) For circumferential weld testing, the minimum number of exposures may correspond to the requirements of ISO 17636-2:2013, class A

Note

일자: 2023.03.08.
조치담당: 최대곤 수석

Responding to 2022 EMSA audit

Responding to 2022 EMSA audit

Present	Amendment	Note
〈Guidance〉 Pt 2	〈Guidance〉 Pt 2	
Annex 2-7 Guidance for non-destructive testing of ship hull steel welds	**Annex 2-7 Guidance for non-destructive testing of ship hull steel welds**	일자: 2023.03.20. 조치담당: 최대곤 수석
6. Ultrasonic Testing(UT)	**6. Ultrasonic Testing(UT)**	
(2) **Extent of survey**	(2) **Extent of survey**	
(A) Survey of welded joints of the shell and deck plating in ships	(A) Survey of welded joints of the shell and deck plating in ships	Typo
(a) The survey location and distribution of checkpoints of ultrasonic inspection are to comply with the requirements given in (A) of **3** (2).	(a) The survey location and distribution of checkpoints of ultrasonic inspection are to comply with the requirements given in (A) of **5** (2).	
(b) Test range of ultrasonic inspection is entire length of the joint or 750 mm, whichever is smaller.	(b) Test range of ultrasonic inspection is entire length of the joint or 750 mm, whichever is smaller.	
(B) Survey of welded joints of internal structural members of ships	(B) Survey of welded joints of internal structural members of ships	
(a) The survey location and distribution of checkpoints of ultrasonic inspection are to comply with the requirements given in (B) of **3** (2).	(a) The survey location and distribution of checkpoints of ultrasonic inspection are to comply with the requirements given in (B) of **5** (2).	
(b) Test range of ultrasonic inspection is entire length of the joint or 300 mm, whichever is smaller.	(b) Test range of ultrasonic inspection is entire length of the joint or 300 mm, whichever is smaller.	
(C) Workmanship control of welded joints of hull	(C) Workmanship control of welded joints of hull	
(a) The survey location and distribution of checkpoints of ultrasonic inspection for workmanship control of welded joints of hull are to comply with the requirements given in (C) of **3** (2).	(a) The survey location and distribution of checkpoints of ultrasonic inspection for workmanship control of welded joints of hull are to comply with the requirements given in (C) of **5** (2).	
(b) Test range of ultrasonic inspection is to comply with the requirements given in (B) above.	(b) Test range of ultrasonic inspection is to comply with the requirements given in (B) above.	
(D) Addition/Reduction in the number of checkpoints	(D) Addition/Reduction in the number of checkpoints	
Addition/reduction in the number of checkpoints is to comply with the requirements given in (D) of **3** (2).	Addition/reduction in the number of checkpoints is to comply with the requirements given in (D) of **5** (2).	

PART 3

Present	Amendment	Note
〈Guidance〉 Pt 3 CHAPTER 19 TUNNELS AND TUNNEL RECESSES 101. Arrangement 【See Rule】 In application to **101. 3** of the Rules, escape trunks of passenger ships are to be in accordance with SOLAS II-1/13.11.1. 110. Ventilators and escape trunks 【See Rule】 Escape trunks of passenger ships are to be in accordance with **SOLAS II-1/13.11.1.** ⚓	〈Guidance〉 Pt 3 CHAPTER 19 TUNNELS AND TUNNEL RECESSES 101. Arrangement 【See Rule】 In application to **101. 3** of the Rules, escape trunks of passenger ships are to be in accordance with **SOLAS II-1/13.10.1.** 110. Ventilators and escape trunks 【See Rule】 Escape trunks of passenger ships are to be in accordance with **SOLAS II-1/13.10.1.** ⚓	- errata

Present	Amendment	Note
〈Rule〉 Pt 3 CHAPTER 7 DOUBLE BOTTOMS Section 5 Inner Bottom Plating, Margin Plates and Bottom Shell Plating 501. Thickness of inner bottom plating 【See Guidance】 **3.** The thickness of inner bottom plating under hatchway, where no ceiling is provided, is to be increased by 2 mm above that obtained from the second formula in **Par 1** or that specified in 101. 5, whichever is the greater, except where the provision in **Par 4** is applied.	〈Rule〉 Pt 3 CHAPTER 7 DOUBLE BOTTOMS Section 5 Inner Bottom Plating, Margin Plates and Bottom Shell Plating 501. Thickness of inner bottom plating 【See Guidance】 **3.** The thickness of inner bottom plating under hatchway, where no ceiling is provided, is to be increased by 2 mm above that obtained from the second formula in **Par 1** or that specified in 101. 6, whichever is the greater, except where the provision in **Par 4** is applied.	

Present	Amendment	Note
〈Guidance〉 Pt 3 CHAPTER 7 DOUBLE BOTTOMS Section 2 Centre Girders and Side Girders 203. Thickness【See Rule】 **1.** Where the ratio of load per square meter of double bottom (kN/m^2) to d is less than 5.40, C_1 in the formula in **203.** (1) of the Rules is to be obtained from the following formula. 〈omit〉 a = as obtained from the following formula $a = 1.35 - \frac{h\gamma}{d}$ h = as specified in **403. 2** of the Rules γ = as specified in **101. 6** of the Rules b = coefficient, for the longitudinal framed construction = 17 for the transversely framed construction = 20	〈Guidance〉 Pt 3 CHAPTER 7 DOUBLE BOTTOMS Section 2 Centre Girders and Side Girders 203. Thickness【See Rule】 **1.** Where the ratio of load per square meter of double bottom (kN/m^2) to d is less than 5.40, C_1 in the formula in **203.** (1) of the Rules is to be obtained from the following formula. 〈omit〉 a = as obtained from the following formula $a = 1.35 - \frac{h\gamma}{d}$ h = as specified in **403. 2** of the Rules γ = as specified in **101. 7** of the Rules b = coefficient, for the longitudinal framed construction = 17 for the transversely framed construction = 20	

PART 4

Present	Amendment	Note
〈Rule〉 Pt 4 **CHAPTER 1 RUDDERS** **Section 1 General** 101. ~102. 〈omitted〉 103. Materials *(2021)* **【See Guidance】** **1.** 〈omitted〉 **2.** The parts of rudders are to be made of approved rolled hull materials in accordance with **Pt 2, Ch 1** of the Rules. The material factor K it to be taken as defined in **Table 4.1.2**. **3.** 〈omitted〉 104. ~107. 〈omitted〉 **Section 2 ~ Section 6 〈omitted〉** **Section 7 Couplings between Rudder Stocks and Main Pieces** **701. Horizontal flange couplings 【See Guidance】** **1.** Coupling bolts are to be reamer bolts and at least 6 reamer bolts are to be used in each coupling. **2.** Couplings are to comply with the requirements in Table 4.1.7. **3.** The welded joint between the rudder stock and the flange is to be made in accordance with **Figure 4.1.5** or equivalent. 〈below omitted〉	**〈Rule〉 Pt 4** **CHAPTER 1 RUDDERS** **Section 1 General** 101. ~102. 〈same as present〉 103. Materials *(2021)* **【See Guidance】** **1.** 〈same as present〉 **2.** Welded parts of rudders are to be made of approved rolled hull materials in accordance with **Pt 2, Ch 1** of the Rules. The material factor K it to be taken as defined in **Table 4.1.2**. **3.** 〈same as present〉 104. ~107. 〈same as present〉 **Section 2 ~ Section 6 〈same as present〉** **Section 7 Couplings between Rudder Stocks and Main Pieces** **701. Horizontal flange couplings 【See Guidance】** **1.** Coupling bolts are to be reamer bolts and at least 6 reamer bolts are to be used in each coupling. **2.** Couplings are to comply with the requirements in Table 4.1.8. **3.** The welded joint between the rudder stock and the flange is to be made in accordance with **Figure 4.1.5** or equivalent. 〈below omitted〉	Clarification of Phrase (Reflection of IACS U R S10)

Present	Amendment	Note
〈Guidance〉 Pt 4 **CHAPTER 2 HATCHWAYS AND OTHER DECK OPENINGS** **Section 1 ~ Section 2 〈omitted〉** **Section 3 Hatch cover strength criteria** **303. Net plate thickness of hatch cover** 1. In **303. 3** (4) of the Rules, the term "should be determined according to the Society" means the case where the lower plating not be less than 2.0 mm. **【See Rule】** 2. In **303. 4** of the Rules, the term "have to be derived from the Society" means to comply with Pt 7, Ch 3, 301. of the Guidance. **【See Rule】** 〈below omitted〉 **CHAPTER 4 BULWARKS, FREEING PORTS, SIDE SCUTTLES, RECTANGULAR WINDOWS, VENTILATORS AND PERMANENT GANGWAYS** **Section 1 〈omitted〉** **Section 2 Freeing Ports** **201. General 【See Rule】〈omitted〉** **202. Freeing port area 【See Rule】** **1.~7. 〈omitted〉** 8. Nevertheless 101. 1 thou. 3 of the Rules, where the ships operate within costal area which the ship could go and return from smooth water within 2 hours by the maximum speed, the freeing port area could be deducted to the half area of the required freeing port area. 〈below omitted〉	**〈Guidance〉 Pt 4** **CHAPTER HATCHWAYS AND OTHER DECK OPENINGS** **Section 1 ~ Section 2 〈same as present〉** **Section 3 Hatch cover strength criteria** **303. Net plate thickness of hatch cover** 1. In **303. 3** (4) of the Rules, the term "should be determined according to the Society" means the case where the lower plating not be less than 2.0 mm. **【See Rule】** 2. In **303. 4** of the Rules, the term "have to be derived from the Society" means to comply with Pt 7, Ch 7, 301. of the Guidance. **【See Rule】** 〈below omitted〉 **CHAPTER 4 BULWARKS, FREEING PORTS, SIDE SCUTTLES, RECTANGULAR WINDOWS, VENTILATORS AND PERMANENT GANGWAYS** **Section 1 〈same as present〉** **Section 2 Freeing Ports** **201. General 【See Rule】〈same as present〉** **202. Freeing port area 【See Rule】** **1.~7. 〈same as present〉** 8. Nevertheless 202. 1 thou. 3 of the Rules, where the ships operate within costal area which the ship could go and return from smooth water within 2 hours by the maximum speed, the freeing port area could be deducted to the half area of the required freeing port area. 〈below omitted〉	-correction of errors

Present	Amendment	Note
〈Rule〉 Pt 4 **CHAPTER 2 HATCHWAYS AND OTHER DECK OPENINGS** **Section 1 ~ Section 2 〈omitted〉** **Section 3 Hatch cover strength criteria** 301. ~ 302. 〈omitted〉 **303. Net plate thickness of hatch cover** 1. The local net plate thickness $t(\mathrm{mm})$ of the hatch cover top plating is not to be less than: $$t = 15.8F_pS\sqrt{\frac{P}{0.95\sigma_y}} \quad (\mathrm{mm})$$ and to be not less than 1 % of the spacing of the stiffener or 6 mm if that be greater. F_p = factor for combined membrane and bending response = 1.5 in general = $1.9\sigma/(0.8\sigma_y)$, for $\frac{\sigma}{\sigma_a} \geq 0.8$ for the attached plate flange of primary supporting members S = stiffener spacing (m) p = pressure P_V and P_L $(\mathrm{kN/m^2})$ as defined in **202.** and **204. 1.** σ = normal stress$(\mathrm{N/mm^2})$ of hatch cover top plating as determined by **Fig 4.2.4** 〈below omitted〉	**〈Rule〉 Pt 4** **CHAPTER 2 HATCHWAYS AND OTHER DECK OPENINGS** **Section 1 ~ Section 2 〈same as present〉** **Section 3 Hatch cover strength criteria** 301. ~ 302. 〈same as present〉 **303. Net plate thickness of hatch cover** 1. The local net plate thickness $t(\mathrm{mm})$ of the hatch cover top plating is not to be less than: $$t = 15.8F_pS\sqrt{\frac{P}{0.95\sigma_Y}} \quad (\mathrm{mm})$$ and to be not less than 1 % of the spacing of the stiffener or 6 mm if that be greater. F_p = factor for combined membrane and bending response = 1.5 in general = $1.9\sigma/(0.8\sigma_y)$, for $\frac{\sigma}{\sigma_a} \geq 0.8$ for the attached plate flange of primary supporting members S = stiffener spacing (m) p = pressure P_V and P_L $(\mathrm{kN/m^2})$ as defined in **202.** and **204. 1.** σ = normal stress$(\mathrm{N/mm^2})$ of hatch cover top plating as determined by **Fig 4.2.4** 〈below omitted〉	Correction of typo error

Present	Amendment	Note
〈Rule〉 Pt 4 **CHAPTER 9 STRENGTH AND SECURING OF SMALL HATCHES, FITTINGS AND EQUIPMENT ON THE FORE DECK** **Section 1 Application and Implementation** 101. Application 〈omitted〉 102. Implementation The detail requirements for implementation of this chapter, refer to Pt 1, Ch 2, 1701. of the Rules. 〈below omitted〉	**〈Rule〉 Pt 4** **CHAPTER 9 STRENGTH AND SECURING OF SMALL HATCHES, FITTINGS AND EQUIPMENT ON THE FORE DECK** **Section 1 Application and Implementation** 101. Application 〈same as present〉 102. Implementation The detail requirements for implementation of this chapter, refer to Pt 1, Ch 2, 1801. of the Rules. 〈below omitted〉	Correction of reference.

PART 5

Present	Amendment	Note
# CHAPTER 1 GENERAL ## Section 1 General ## Section 2 Plans and Documents 201. ~ 202. 〈omitted〉 **203. Plans and documents to be submitted by the licensor and licensee of internal combustion engines 【See Guidance】** **Table 5.1.5 Documents of Internal combustion engines to be submitted for information** | No.	Drawings and data | |---|---| | 1 | Engine particulars (e.g. Data sheet with general engine information (to be submitted in accordance with separate sheet required by the Society as possible), Project Guide, Marine Installation Manual) | | ~ | ~ | | 29 | Type approval certification for environmental tests, control components(6) | (Notes) (1) ~ (4) 〈omitted〉 (5) Where engines rely on hydraulic, pneumatic or electronic control of fuel injection and/or valves, a failure mode and effects analysis (FMEA) is to be submitted to demonstrate that failure of the control system will not result in the operation of the engine being degraded beyond acceptable performance criteria for the engine. The FMEA reports required will not be explicitly approved by the Society. (6) 〈omitted〉	# CHAPTER 1 GENERAL ## Section 1 General ## Section 2 Plans and Documents 201. ~ 202. 〈same as the present〉 **203. Plans and documents to be submitted by the licensor and licensee of internal combustion engines 【See Guidance】** **Table 5.1.5 Documents of Internal combustion engines to be submitted for information** | No.	Drawings and data | |---|---| | 1 | Engine particulars (e.g. Data sheet with general engine information (to be submitted in accordance with separate sheet required by the Society as possible), Project Guide, Marine Installation Manual) | | ~ | ~ | | 29 | Type approval certification for environmental tests, control components(6) | (Notes) (1) ~ (4) 〈same as the present〉 (5) Where engines rely on hydraulic, pneumatic or electronic control of fuel injection and/or valves, a failure mode and effects analysis (FMEA) is to be submitted to demonstrate that failure of the control system will not result in the operation of the engine being degraded beyond acceptable performance criteria for the engine. ~~The FMEA reports required will not be explicitly approved by the Society.~~ (6) 〈same as the present〉	〈Pt 5 Rules〉 Reflecting UR M44 (Rev.10 Corr.1 Feb 2022) - As the title of the table, FMEA reports are already stated for information.

〈Present〉

Table 1 Data Sheet with General Engine Information

Class Application number (if applicable): Engine Manufacturer's Application Identification Number:

General Data	
Engine Designer: Contact Person: Address:	Engine Manufacturer(s), Licensee(s) and/or Manufacturing Sites*Name Country

1. Document purpose *(select options from either 1a or 1b)*	
1a. Type Approval Application	
Service Requested ☐ New Type Approval ☐ Renew Type Approval ☐ Amend Type Approval ☐ Design Evaluation ☐ Update TA Supplement ☐ Other	*Required activities†* • *DA, TT, CoP* • *CoP, if design change then amended or new certificate process to be followed* • *DA & CoP, Further TT if previously approved engine has been substantively modified (as required by UR M71)* • *DA, TT, applicable where designer does not have production facilities, Type Approval to be granted to specific production facility once associated CoP has been completed* • *Update to Supplement, only for minor changes not affecting the Type Approval Certificate* • *e.g. National/Statutory Administration requirements i.e. MSC.81(70), as amended by IMO resolutions up to MSC.472(101), for emergency engines*
For TA Cert amendments or Supplement updates, details of what is to be changed:	
For 'Other', Details of the requirements to be considered:	
1b. Addendum for Individual Engine FAT and Certification	
☐ Individual engine requiring FAT and Certification, only where the performance data for the engine being certified differs from the details provided on the original Type Approval Application. Only section 3b requires completion. Where changes to other sections are necessary, a new Type Approval Application may be required.	
Reference number of *Internal Combustion Engine Approval Application Form* previously submitted and reference number of the Type Approval Certificate.	*(Copy of original application form to be attached to this document)*

2. Existing documentation			
Previous Class Type Approval Certificate No. or related Design Approval No. *(if applicable)*			
Formerly issued documentation for engine *(E.g. previous type test reports, in-service experience justification reports, etc.)*	Issuing Body:	Document Type:	Document No.:
Existing Certification *(E.g. Manufacturer's quality certification ISO 9001:2015 etc.)*	Issuing Body:	Document Type:	Document No.:

3. Design *(mark all that apply)*					
3a. Engine Particulars:					
Engine Type Manufactured Since‡:			Number of delivered marine engines‡:		
Application	☐ Direct drive Propulsion (☐ Single engine / ☐ Multi-engine installation)		☐ Auxiliary (☐ Aux. Services / ☐ Electric Propulsion)		☐ Emergency
Mechanical Design	☐ 2-stroke ☐ Cross-head Cylinder bore(mm)	☐ 4-stroke ☐ Trunk-piston	☐ In-line ☐ Reversible Length of piston stroke (mm)	☐ Vee (V-angle °) ☐ Non-reversible	☐ Other ( )
Supercharging	☐ Without supercharging	☐ With supercharging ☐ Without charge air cooling ☐ Constant-pressure charging system		☐ With charge air cooling ☐ Pulsating pressure charging system	
Valve operation	☐ Cam control	☐ Electronic control			
Fuel Injection	☐ Direct injection	☐ Indirect injection	☐ Cam controlled injection	☐ Electronically controlled injection	

〈Amendment〉

Table 1 Data Sheet with General Engine Information

Class Application number (if applicable): Engine Manufacturer's Application Identification Number:

General Data	
Engine Designer: Contact Person: Address:	Engine Manufacturer(s), Licensee(s) and/or Manufacturing Sites Name Country

1. Document purpose *(select options from either 1a or 1b)*	
1a. Type Approval Application	
Service Requested ☐ New Type Approval ☐ Renew Type Approval ☐ Amend Type Approval ☐ Design Evaluation ☐ Update TA Supplement ☐ Other	*Required activities†* • *DA, TT, CoP* • *CoP, if design change then amended or new certificate process to be followed* • *DA & CoP, Further TT if previously approved engine has been substantively modified (as required by UR M71)* • *DA, TT, applicable where designer does not have production facilities, Type Approval to be granted to specific production facility once associated CoP has been completed* • *Update to Supplement, only for minor changes not affecting the Type Approval Certificate* • *e.g. National/Statutory Administration requirements i.e. MSC.81(70), as amended ~~by IMO resolutions up to MSC.472(101)~~, for emergency engines*
For TA Cert amendments or Supplement updates, details of what is to be changed:	
For 'Other', Details of the requirements to be considered:	
1b. Addendum for Individual Engine FAT and Certification	
☐ Individual engine requiring FAT and Certification, only where the performance data for the engine being certified differs from the details provided on the original Type Approval Application. Only section 3b requires completion. Where changes to other sections are necessary, a new Type Approval Application may be required.	
Reference number of *Internal Combustion Engine Approval Application Form* previously submitted and reference number of the Type Approval Certificate.	*(Copy of original application form to be attached to this document)*

2. Existing documentation			
Previous Class Type Approval Certificate No. or related Design Approval No. *(if applicable)*			
Formerly issued documentation for engine *(E.g. previous type test reports, in-service experience justification reports, etc.)*	Issuing Body:	Document Type:	Document No.:
Existing Certification *(E.g. Manufacturer's quality certification ISO 9001:2015 etc.)*	Issuing Body:	Document Type:	Document No.:

3. Design *(mark all that apply)*				
3a. Engine Particulars:				
Engine Type Manufactured Since‡:			Number of delivered marine engines‡:	
Application	☐ Direct drive Propulsion (☐ Single engine / ☐ Multi-engine installation)		☐ Auxiliary (☐ Aux. Services / ☐ Electric Propulsion)	☐ Emergency
Mechanical Design	☐ 2-stroke ☐ Cross-head Cylinder bore(mm)	☐ 4-stroke ☐ Trunk-piston	☐ In-line ☐ Reversible Length of piston stroke (mm)	☐ Vee (V-angle °) ☐ Non-reversible ☐ Other ( )
Supercharging	☐ Without supercharging	☐ With supercharging ☐ Without charge air cooling ☐ Constant-pressure charging system		☐ With charge air cooling ☐ Pulsating pressure charging system
Valve operation	☐ Cam control	☐ Electronic control		
Fuel Injection	☐ Direct injection	☐ Indirect injection	☐ Cam controlled injection	☐ Electronically controlled injection

Amendments	Note

〈Rule〉 Pt 5

CHAPTER 6 AUXILIARIES AND PIPING ARRANGEMENT

Section 1 General

104. Type of connections

〈Omitted〉

Table 5.6.10 Application of Mechanical Joints

The following table indicates systems where the various kinds of joints may be accepted. However, in all cases, acceptance of the joint type is to be subject to approval for the intended application, and subject to conditions of the approval and applicable Rules. Further, relevant statutory requirements must be taken into consideration. In cases exposure time (t_T) is greater than 30 minutes the dry-wet test conditions are 8 minutes dry and, accordingly, the wet period t_T-8 min.

	Systems	Kind of connections				
		Pipe Unions	Compression Couplings	Slip-on joints	Classification of pipe system	Fire endurance test condition(7)
Flammable fluids (Flash point ≤ 60 °C)						
1	Cargo oil lines(1)	○	○	○	dry	30 min dry (*)
2	Crude oil washing lines(1)	○	○	○	dry	
3	Vent lines(3)	○	○	○	dry	
Inert Gas						
4	Water seal effluent lines	○	○	○	wet	30 min wet (*)
5	Scrubber effluent lines	○	○	○	wet	30 min wet (*)
6	Main lines(1)(2)	○	○	○	dry	30 min dry (*)
7	Distributions lines(1)	○	○	○	dry	30 min dry (*)
Flammable fluids (Flash point 〉 60 °C)						
8	Cargo oil lines(1)	○	○	○	dry	30 min dry (*)
9	Fuel oil lines(2)(3)	○	○	○	wet	30 min wet (*)
10	Lubricating oil lines(2)(3)	○	○	○	wet	
11	Hydraulic oil(2)(3)	○	○	○	wet	
12	Thermal oil(2)(3)	○	○	○	wet	

Note:
- Editorial correction made in accordance with IACS UR P 2.7.4 Rev.10
- Editorial correction made in accordance with IACS UR P 2.7.4 Rev.10

Amendments	Note

Table 5.6.10 Application of Mechanical Joints (continued)

Sea water						
13	Bilge lines[4]	○	○	○	dry/wet	8 min dry + 22 min wet (*)
14	Permanent water filled fire extinguishing systems, e.g. fire main, sprinkler systems[3]	○	○	○	wet	30 min wet (*)
15	Non-permanent water filled fire extinguishing systems, e.g. foam, drencher systems and fire main[3]	○	○	○	dry/wet	8 min dry + 22 min wet (*) For foam systems FSS Code Chapter 6 to be observed
16	Ballast system[4]	○	○	○	wet	30 min wet (*)
17	Cooling water system[4]	○	○	○	wet	30 min wet (*)
18	Tank cleaning services	○	○	○	dry	Fire endurance test not required
19	Non-essential systems	○	○	○	dry dry/wet wet	Fire endurance test not required

Amendments	Note
Table 5.6.10 Application of Mechanical Joints (continued)	- Editorial correction made in accordance with IACS UR P 2.7.4 Rev.10

Systems		Kind of connections				
		Pipe Unions	Compression Couplings	Slip-on joints	Classification of pipe system	Fire endurance test condition[7]
Fresh water						
20	Cooling water system[4]	○	○	○	wet	30 min wet (*)
21	Condensate return[4]	○	○	○	wet	30 min wet (*)
22	Non-essential system	○	○	○	dry dry/wet wet	Fire endurance test not required
Sanitary/Drains/Scuppers						
23	Deck drains (internal)[5]	○	○	○	dry	Fire endurance test not required
24	Sanitary drains	○	○	○	dry	
25	Scuppers and discharge (overboard)	○	○	–	dry	
Sounding/Vent						
26	Water tanks/Dry spaces	○	○	○	dry, wet	Fire endurance test not required
27	Oil tanks (f.p. 〉60 °C)[2][3]	○	○	○	dry	

Amendments	Note

Table 5.6.10 Application of Mechanical Joints (continued)

Miscellaneous						
28	Starting/Control air(4)	○	○	–	dry	30 min dry (*)
29	Service air (non-essential)	○	○	○	dry	Fire endurance test not required
30	Brine	○	○	○	wet	
31	CO2 system (outside protected space)	○	○	–	dry	30 min dry (*)
32	CO2 system (inside protected space)	○	○	–	dry	Mechanical joints shall be constructed of materials with melting point above 925°C. Ref. to FSS Code Chapter 5.
33	Steam	○	○	○~~(5)~~(6)	wet	Fire endurance test not required

- Editorial correction made in accordance with IACS UR P 2.7.4 Rev.10

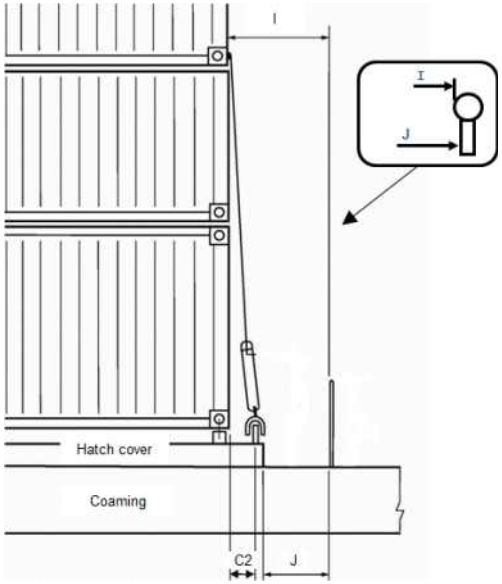
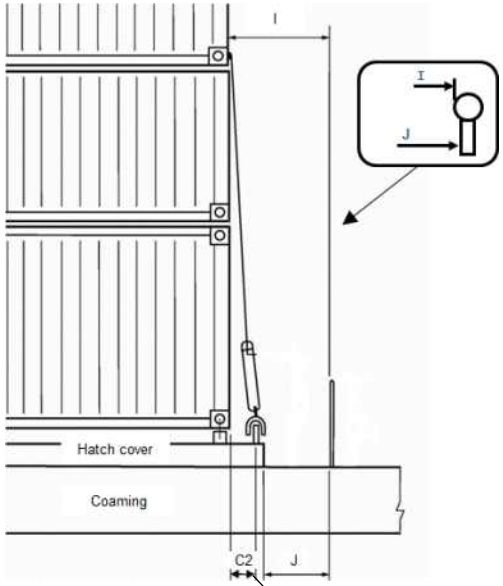
Amendments	Note
Table 5.6.10 Application of Mechanical Joints (continued) Abbreviations ○ : Application is allowed, – : Application is not allowed, * : Fire endurance test as specified in **Ch 3, Sec 18, Table 3.18.2, 6.** of the **"Guidance for Approval of Manufacturing Process and Type Approval, Etc."** NOTES – Fire resistance capability If mechanical joints include any components which readily deteriorate in case of fire, the following footnotes are to be observed: 1) Fire endurance test shall be applied when mechanical joints are installed in pump rooms and open decks. 2) Slip on joints are not accepted ~~Not~~ inside machinery spaces of category A or accommodation spaces. May be accepted in other machinery spaces provided the joints are located in easily visible and accessible positions(refer to MSC/Circ.734). 3) Approved fire-resistant types except in cases where such mechanical joints are installed on open decks, as defined in SOLAS II-2/Reg. 9.2.3.3.2.2(10) and not used for fuel oil lines. 4) Fire endurance test shall be applied when mechanical joints are installed inside machinery spaces of category A. NOTES – General 5) Only above bulkhead deck of passenger ships and freeboard deck of cargo ships. 6) Slip type slip-on joints as shown in Fig 5.6.2. May be used for pipes on deck with a design pressure of 10 bar or less. 7) If a connection has passed the "30 min dry" test, it is considered suitable also for applications for which the "8 min dry+22 min wet" and/or "30 min wet " tests are required. If a connection has passed the "8 min dry+22 min wet" test, it is considered suitable also for applications for which the "30 min wet" test is required.	– Editorial correction made in accordance with IACS UR P 2.7.4 Rev.10

Present	Amendment	Note
# 〈Rule〉 Pt 5 # CHAPTER 6 AUXILIARIES AND PIPING ARRANGEMENT ## Section 6 Steam and Exhaust Gas Piping **602. Exhaust gas piping** 【See Rule】 **1.** In application to **602. 1** of the Rules, the Selective Catalytic Reduction(SCR) system using ammonia solution or urea solution as the reductant agents is to comply with requirements in **Sec 1** of **Guidance for exhaust gas emission abatement system** in addition to those in this Chapter. **2.** In application to **602. 1** of the Rules, the ships provided the Exhaust Gas Recirculation(EGR) system are to comply with requirements in **Sec 2** of **Guidance for exhaust gas emission abatement system** in addition to those in this Chapter. **3.** In application to **602.** of the Rules, the ships provided the Exhaust Gas Cleaning(EGC) system are to comply with requirements in **Sec 3** of **Guidance for exhaust gas emission abatement system** in addition to those in this Chapter. *(2017)*	# 〈Rule〉 Pt 5 # CHAPTER 6 AUXILIARIES AND PIPING ARRANGEMENT ## Section 6 Steam and Exhaust Gas Piping **602. Exhaust gas piping** 【See Rule】 **1.** In application to **602. 1** of the Rules, the Selective Catalytic Reduction(SCR) system using ammonia solution or urea solution as the reductant agents is to comply with requirements in **Ch 2** of **Guidance for Prevention System of Pollution from Ships** in addition to those in this Chapter. **2.** In application to **602. 1** of the Rules, the ships provided the Exhaust Gas Recirculation(EGR) system are to comply with requirements in **Ch 2** of **Guidance for Prevention System of Pollution from Ships** in addition to those in this Chapter. **3.** In application to **602.** of the Rules, the ships provided the Exhaust Gas Cleaning(EGC) system are to comply with requirements in **Ch 3** of **Guidance for Prevention System of Pollution from Ships** in addition to those in this Chapter. *(2017)*	

PART 7

Present	Amendment	Note
〈Rules〉 Pt 7 Ch 3 BULK CARRIERS Section 9 Hatch Covers and Hatch Coamings of Cargo Holds 906. Corrosion addition and steel renewal **1. Hatch covers** (5) Coating is to be maintained in GOOD condition, as defined in **Pt 1, Ch 2, Sec. 1. 19.** **2. Hatch coamings** (4) Coating is to be maintained in GOOD condition, as defined in **Pt 1, Ch 2, Sec. 1, 19.**	〈Rules〉 Pt 7 Ch 3 BULK CARRIERS Section 9 Hatch Covers and Hatch Coamings of Cargo Holds 906. Corrosion addition and steel renewal **1. Hatch covers** (5) Coating is to be maintained in GOOD condition, as defined in **Pt 1, Ch 2, Sec. 1. 20.** **2. Hatch coamings** (4) Coating is to be maintained in GOOD condition, as defined in **Pt 1, Ch 2, Sec. 1, 20.**	

Present	Amendment	Note
〈Guidance〉 Pt 7 **Ch 4 CONTAINER SHIPS** **Section 1 General** 101. Application 【See Rule】 In application to **101. 4** of the Rules, the term "discretion of the Society" means to comply with the direct strength calculation specified in **Pt 3, Ch 1, 206.** of the Rules, or to accept in accordance with **Pt 1, Ch 1,** 104. of the Guidance. **Annex 7-5 Additional Requirements for Existing Bulk Carriers** **1. Scantling of the transverse watertight corrugated bulkhead between cargo holds No.1 and 2, with cargo hold No.1 flooded, for existing bulk carriers** (6) Corrosion addition and steel renewal (G) Guidance on renewal/reinforcement of vertically corrugated transverse watertight bulkhead between cargo holds Nos. 1 and 2 (b) It will take into account the following: (i) Scantlings of individual vertical corrugations will be assessed for reinforcement / renewal based on thickness measurements obtained in accordance with **Pt 1, Annex 1-5,** Table 8 at their lower end, at mid-depth and in way of plate thickness changes in the lower 70 %. These considerations will take into account the provision of gussets and shedder plates and the benefits they offer, provided that they comply with (4) (B) and (A) to (F).	〈Guidance〉 Pt 7 **Ch 4 CONTAINER SHIPS** **Section 1 General** 101. Application 【See Rule】 In application to **101. 4** of the Rules, the term "discretion of the Society" means to comply with the direct strength calculation specified in **Pt 3, Ch 1, 206.** of the Rules, or to accept in accordance with **Pt 1, Ch 1,** 105. of the Rules. **Annex 7-5 Additional Requirements for Existing Bulk Carriers** **1. Scantling of the transverse watertight corrugated bulkhead between cargo holds No.1 and 2, with cargo hold No.1 flooded, for existing bulk carriers** (6) Corrosion addition and steel renewal (G) Guidance on renewal/reinforcement of vertically corrugated transverse watertight bulkhead between cargo holds Nos. 1 and 2 (b) It will take into account the following: (i) Scantlings of individual vertical corrugations will be assessed for reinforcement / renewal based on thickness measurements obtained in accordance with **Pt 1, Annex 1-5,** Table 9 at their lower end, at mid-depth and in way of plate thickness changes in the lower 70 %. These considerations will take into account the provision of gussets and shedder plates and the benefits they offer, provided that they comply with (4) (B) and (A) to (F).	

Present	Amendment	Note
Annex 7-11 Guidance on Providing Safe Working Conditions for Securing of Containers on Deck *(2019)*	Annex 7-11 Guidance on Providing Safe Working Conditions for Securing of Containers on Deck *(2019)*	
 Fig 4 Work area between hatch covers	 Fig 4 Work area between hatch covers C3	

Present	Amendment	Note
〈Guidance〉 Pt 7	〈Guidance〉 Pt 7	
CHAPTER 4 CONTAINER SHIPS	**CHAPTER 4 CONTAINER SHIPS**	
Section 10 Freight Container Securing Arrangement	**Section 10 Freight Container Securing Arrangement**	
1002. Freight container securing systems 【See Rule】	**1002. Freight container securing systems 【See Rule】**	
3. Inspection procedure of Freight container securing arrangement	**3.** Inspection procedure of Freight container securing arrangement	
(3) For fixed securing devices such as items 11. to 14. in **Table 3.25.2** of 「**Guidance for Approval of Manufacturing Process and Type Approval, etc.**」 consideration will be given to a reduced frequency of mechanical production testing provided the following (A) and (B). Where manufacturer for the fixed securing devices has the certificates of this Class' quality assurance system, inspection procedure is to comply with **Ch 5, 305.** of 「**Guidance for Approval of Manufacturing Process and Type Approval, etc.**」	(3) For fixed securing devices such as items 12. to 15. in **Table 3.25.2** of 「**Guidance for Approval of Manufacturing Process and Type Approval, etc.**」 consideration will be given to a reduced frequency of mechanical production testing provided the following (A) and (B). Where manufacturer for the fixed securing devices has the certificates of this Class' quality assurance system, inspection procedure is to comply with **Ch 5, 305.** of 「**Guidance for Approval of Manufacturing Process and Type Approval, etc.**」	
Annex 7-11 Guidance on Providing Safe Working Conditions for Securing of Containers on Deck	**Annex 7-11 Guidance on Providing Safe Working Conditions for Securing of Containers on Open Deck**	- Inner decks of multi-deck ship are not applicable.
1. General	**1. General**	
(1) Objective The objective of the additional special feature notation CSAP should provide safe working conditions in safe access and safe places of work, when they are worked in container securing operations on deck.	(1) Objective The objective of the additional special feature notation CSAP should provide safe working conditions in safe access and safe places of work, when they are worked in container securing operations on open deck.	
(3) Application Ships complying with this guidelines will be assigned the additional special feature notation CSAP. The additional special feature notation CSAP is applicable to ships designed for carrying containers on deck. The additional special feature notation CSAP can be applied to other ships upon request.	(3) Application Ships complying with this guidelines will be assigned the additional special feature notation CSAP. The additional special feature notation CSAP is applicable to ships designed for carrying containers on open deck. The additional special feature notation CSAP can be applied to other ships upon request.	

Present	Amendment	Note
〈Rule〉 Pt 7 CHAPTER 7 CAR FERRIES AND ROLL-ON/ROLL-OFF SHIPS Section 3 Deck Structure 301. Application 【See Guidance】 The arrangements and scantlings of vehicle decks for the carriage of cars, trucks, etc., are be in accordance with the discretion of the Society.	〈Rule〉 Pt 7 CHAPTER 7 CAR FERRIES AND ROLL-ON/ROLL-OFF SHIPS Section 3 Deck Structure 301. Application 【See Guidance】 The arrangements and scantlings of vehicle decks for the carriage of cars, trucks, etc., are to be in accordance with the discretion of the Society.	- errata
〈Guidance〉 Pt 7 CHAPTER 7 CAR FERRIES AND ROLL-ON/ROLL-OFF SHIPS Section 3 Deck Structure 301. Application 【See Rule】 1. Thickness of vehicle deck *(2022)* The thickness of vehicle deck is to be less than that obtained from the following (1) and (2). *(2017)* However, the thickness of plating of weather decks is to be 1 mm thicker than obtained from those formulae. (1) Where ~ 〈omission〉	〈Guidance〉 Pt 7 CHAPTER 7 CAR FERRIES AND ROLL-ON/ROLL-OFF SHIPS Section 3 Deck Structure 301. Application 【See Rule】 1. Thickness of vehicle deck *(2022)* The thickness of vehicle deck is not to be less than that obtained from the following (1) and (2). *(2017)* However, the thickness of plating of weather decks is to be 1 mm thicker than obtained from those formulae. (1) Where ~ 〈same as current〉	- '차량갑판의 두께는 다음 (1) 또는 (2)호에 의한 것 이상이어야 한다.'

Current	Amendment	Note
〈Guidance〉 Pt 7 **Annex 7-2 Guidance for the Container Securing Arrangements** **9. Container Lashing calculation program and instrument** (5) On-board installation test and approval (A) ~ (E) 〈omit〉 (6) Change of Approval 〈omit〉	〈Guidance〉 Pt 7 **Annex 7-2 Guidance for the Container Securing Arrangements** **9. Container Lashing calculation program and instrument** (5) On-board installation test and approval (A) ~ (E) 〈same as current〉 (F) The lashing calculation program approval certificate and approved test report are to be retained on board along with the user manual. (6) Change of Approval 〈same as current〉	- 영문 오류 (바) 고박강도계산프로그램 시스템 승인증서 및 승인된 Test report는 사용자 매뉴얼과 함께 본선에 보관되어야 한다.

PART 7 (CH5, 6)

Present	Amendment	Note
〈Rules〉 Pt 7 CHAPTER 6 SHIPS CARRYING DANGEROUS CHEMICALS IN BULK Section 4 Cargo Containment 106. Definitions (IBC Code 1.3) The definitions of terms are to be as specified in the following and **Sec 4,** unless otherwise specified elsewhere. 23. **"Noxious liquid substance"** means any substance indicated in the pollution Category column of chapter 17 or 18 ~~of the International Chemical Code~~, or the current MEPC.2/Circular or provisionally assessed under the provisions of regulation 6.3 of MARPOL Annex II as falling into category X, Y or Z.	〈Rules〉 Pt 7 CHAPTER 6 SHIPS CARRYING DANGEROUS CHEMICALS IN BULK Section 4 Cargo Containment 106. Definitions (IBC Code 1.3) The definitions of terms are to be as specified in the following and **Sec 4,** unless otherwise specified elsewhere. 23. **"Noxious liquid substance"** means any substance indicated in the pollution Category column of chapter 17 or 18, or the current MEPC.2/Circular or provisionally assessed under the provisions of regulation 6.3 of MARPOL Annex II as falling into category X, Y or Z.	

Present	Amendment	Note
〈Guidance〉 Pt 7	〈Guidance〉 Pt 7	
# Ch 5 SHIPS CARRYING LIQUEFIED GASES IN BULK	# Ch 5 SHIPS CARRYING LIQUEFIED GASES IN BULK	
## Section 4 Cargo Containment	## Section 4 Cargo Containment	
425. Integral tanks 【See Rule】	**425. Integral tanks** 【See Rule】	
2. Testing For the purpose of the requirements in **425. 5** of the Rules, the hydraulic test of integral tanks is to conform to the requirements in Pt 3, Ch 1, 209. of the Rules. However, for tanks whose design MARVS exceeds 0.025 MPa or specific gravity of the cargo exceeds 0.6, the test may be such as to conform to the requirements specified in **421. 5** of the Rules correspondingly.	**2. Testing** For the purpose of the requirements in **425. 5** of the Rules, the hydraulic test of integral tanks is to conform to the requirements in Pt 1, Annex1-16. of the Guidance. However, for tanks whose design MARVS exceeds 0.025 MPa or specific gravity of the cargo exceeds 0.6, the test may be such as to conform to the requirements specified in **421. 5** of the Rules correspondingly.	
508. Piping fabrication and joining details **4.** In application to **508. 5** of the Rules, the term "the Society may consider alternative arrangementse" means the acceptance in accordance with **Pt 1, Ch 1,** 104. of the Guidance. 【See Rule】	**508. Piping fabrication and joining details** **4.** In application to **508. 5** of the Rules, the term "the Society may consider alternative arrangementse" means the acceptance in accordance with **Pt 1, Ch 1,** 105. of the Rules. 【See Rule】	
1103. Water spray system **8. Extension of cargo area** Where "F.O. tanks" are installed at the after end of the aftermost hold space or at the forward end of the forwardmost hold space instead of cofferdams as allowed for in paragraphs **301. 2** and 2 of the Rules, the weather deck area above these tanks is to be regarded as a "cargo area" for the purpose of applying **1103. 6** of the Rules. *(2020)*	**1103. Water spray system** **8. Extension of cargo area** Where "F.O. tanks" are installed at the after end of the aftermost hold space or at the forward end of the forwardmost hold space instead of cofferdams as allowed for in paragraphs **301. 2** and 3 of the Rules, the weather deck area above these tanks is to be regarded as a "cargo area" for the purpose of applying **1103. 6** of the Rules. *(2020)*	

Present	Amendment	Note
Section 13 Instrumentation and Automation Systems **1307. Additional requirements for containment systems requiring a secondary barrier** **2. Temperature indicating devices of cargo tanks when a cargo is carried at a temperature lower than −55°C** For the purpose of the requirements in 1305. 2 (2) and (3) of the Rules, the temperature indicating devices for cases of carrying the cargo at a temperature lower than −55°C are to be in accordance with the following requirements : (1) In order to verify the cooling down or loading procedures according to the requirements in **413.** 1 (1) of the Guidance, temperature indicating devices required in the provisions in 1305. **2** (3) of the Rules are to be provided. (2) The temperature sensors provided for verifying the cooling down procedure specified in the requirements in 1305. **2** (4) of the Rules are to be arranged under considering the arrangement of spray nozzles and construction of cargo containment system. For the other cargo tanks which can be regarded as having the same construction and arrangements as the cargo tanks provided with above sensors, the temperature indicating devices specified in the requirements in preceding ~~(1) and~~ **1305. 1** of the Rules may only be provided.	**Section 13 Instrumentation and Automation Systems** **1307. Additional requirements for containment systems requiring a secondary barrier** **2. Temperature indicating devices of cargo tanks when a cargo is carried at a temperature lower than −55°C** For the purpose of the requirements in 1307. 2 (3) of the Rules, the temperature indicating devices for cases of carrying the cargo at a temperature lower than −55°C are to be in accordance with the following requirements : (1) In order to verify the cooling down or loading procedures according to the requirements in **413.** 4 (1) of the Guidance, temperature indicating devices required in the provisions in 1307. **2** (3) of the Rules are to be provided. (2) The temperature sensors provided for verifying the cooling down procedure specified in the requirements in 1307. **2** (4) of the Rules are to be arranged under considering the arrangement of spray nozzles and construction of cargo containment system. For the other cargo tanks which can be regarded as having the same construction and arrangements as the cargo tanks provided with above sensors, the temperature indicating devices specified in the requirements in preceding **1305. 1** and 1307. 2 (3) of the Rules may only be provided.	

Present	Amendment	Note
〈Rule〉 Pt 7 CHAPTER 5 Ships Carrying Liquefied Gases in Bulk Section 6 Materials of Construction and Quality Control 605. Welding of metallic materials and non-destructive testing (IGC Code 6.5) 【See Guidance】 3. Welding procedure tests for cargo tanks and process pressure vessels (5) Each test shall satisfy the following requirements: (A) tensile tests: cross-weld tensile strength shall not be less than the specified minimum tensile strength for the appropriate parent materials. For aluminium alloys, reference shall be made to **418. 1** (3) with regard to the requirements for weld metal strength of under-matched welds (where the weld metal has a lower tensile strength than the parent metal). In every case, the position of fracture shall be recorded for information.	〈Rule〉 Pt 7 CHAPTER 5 Ships Carrying Liquefied Gases in Bulk Section 6 Materials of Construction and Quality Control 605. Welding of metallic materials and non-destructive testing (IGC Code 6.5) 【See Guidance】 3. Welding procedure tests for cargo tanks and process pressure vessels (5) Each test shall satisfy the following requirements: (A) tensile tests: cross-weld tensile strength shall not be less than the specified minimum tensile strength for the appropriate parent materials. For materials such as aluminium alloys, reference shall be made to **418. 1** (3) with regard to the requirements for weld metal strength of under-matched welds (where the weld metal has a lower tensile strength than the parent metal). In every case, the position of fracture shall be recorded for information.	

Present	Amendment	Reason
[RULE] CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK **Section 1 ~ Section 5 〈Omitted〉** **Section 6 Materials of Construction and Quality Control** **601. ~ 603. <Omitted>** **604. Requirements for metallic materials (IGC Code 6.4)** 1. General requirements for metallic materials (2022) 〈Omitted〉 Table 7.5.4 PLATES, PIPES (SEAMLESS AND WELDED)(1)(2), SECTIONS AND FORGINGS FOR CARGO TANKS AND PROCESS PRESSURE VESSELS FOR DESIGN TEMPERATURES NOT LOWER THAN 0°C. (2022) [See Guidance] 1. CHEMICAL COMPOSITION AND HEAT TREATMENT 〈Omitted〉 2. TENSILE AND TOUGHNESS(IMPACT) TEST REQUIREMENTS 〈Omitted〉 Notes : (1)~(5) 〈Omitted〉 (6) A further set of impact test at mid thickness for products with t〉40mm is required except rolled steels ~~specified in Part 2~~. (7)~(8) 〈Omitted〉	**[RULE] CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK** **Section 1 ~ Section 5 〈Same as the present Rules〉** **Section 6 Materials of Construction and Quality Control** **601. ~ 603. <Same as the present Rules>** **604. Requirements for metallic materials (IGC Code 6.4)** 1. General requirements for metallic materials (2022) 〈Same as the present Rules〉 Table 7.5.4 PLATES, PIPES (SEAMLESS AND WELDED)(1)(2), SECTIONS AND FORGINGS FOR CARGO TANKS AND PROCESS PRESSURE VESSELS FOR DESIGN TEMPERATURES NOT LOWER THAN 0°C. (2022) [See Guidance] 1. CHEMICAL COMPOSITION AND HEAT TREATMENT 〈Same as the present Rules〉 2. TENSILE AND TOUGHNESS(IMPACT) TEST REQUIREMENTS 〈Same as the present Rules〉 Notes : (1)~(5) 〈Same as the present Rules〉 (6) A further set of impact test at mid thickness for products with t〉40mm is required except rolled steels <u>for hull structural in Rules Part 2, Chapter 1, 301 or high strength steels for welded structures in Rules Part 2, Chapter 1, 308</u>. (7)~(8) 〈Same as the present Rules〉	- 문구 명확화 (Reflection of IACS UR W1-Rev.4)

Present	Amendment	Reason
Table 7.5.5a PLATES, SECTIONS AND FORGINGS(1) FOR CARGO TANKS, SECONDARY BARRIERS AND PROCESS PRESSURE VESSELS FOR DESIGN TEMPERATURES BELOW 0°C AND DOWN TO -10°C Maximum thickness 25mm(2) (2022) [See Guidance]	Table 7.5.5a PLATES, SECTIONS AND FORGINGS(1) FOR CARGO TANKS, SECONDARY BARRIERS AND PROCESS PRESSURE VESSELS FOR DESIGN TEMPERATURES BELOW 0°C AND DOWN TO -10°C Maximum thickness 25mm(2) (2022) [See Guidance]	- 문구 명확화 (Reflection of IACS UR W1-Rev.4)
1. CHEMICAL COMPOSITION AND HEAT TREATMENT	1. CHEMICAL COMPOSITION AND HEAT TREATMENT	
〈Omitted〉	〈Same as the present Rules〉	
2. TENSILE AND TOUGHNESS(IMPACT) TEST REQUIREMENTS	2. TENSILE AND TOUGHNESS(IMPACT) TEST REQUIREMENTS	
〈Omitted〉	〈Same as the present Rules〉	
Notes : (1)~(5) 〈Omitted〉 (6) A further set of impact test at mid thickness for products with t〉40mm is required except rolled steels specified in Part 2. (7)~(9) 〈Omitted〉	Notes : (1)~(5) 〈Same as the present Rules〉 (6) A further set of impact test at mid thickness for products with t〉40mm is required except rolled steels for hull structural in Rules Part 2, Chapter 1, 301 or high strength steels for welded structures in Rules Part 2, Chapter 1, 308. (7)~(9) 〈Same as the present Rules〉	
Table 7.5.5b PLATES, SECTIONS AND FORGINGS(1) FOR CARGO TANKS, SECONDARY BARRIERS AND PROCESS PRESSURE VESSELS FOR DESIGN TEMPERATURES BELOW -10°C AND DOWN TO -55°C Maximum thickness 25mm(2) (2022) [See Guidance]	Table 7.5.5b PLATES, SECTIONS AND FORGINGS(1) FOR CARGO TANKS, SECONDARY BARRIERS AND PROCESS PRESSURE VESSELS FOR DESIGN TEMPERATURES BELOW -10°C AND DOWN TO -55°C Maximum thickness 25mm(2) (2022) [See Guidance]	
1. CHEMICAL COMPOSITION AND HEAT TREATMENT	1. CHEMICAL COMPOSITION AND HEAT TREATMENT	
〈Omitted〉	〈Same as the present Rules〉	
2. TENSILE AND TOUGHNESS(IMPACT) TEST REQUIREMENTS	2. TENSILE AND TOUGHNESS(IMPACT) TEST REQUIREMENTS	
〈Omitted〉	〈Same as the present Rules〉	
Notes : (1)~(5) 〈Omitted〉 (6) A further set of impact test at mid thickness for products with t〉40mm is required except rolled steels ~~specified in Part 2~~. (7)~(9) 〈Omitted〉	Notes : (1)~(5) 〈Same as the present Rules〉 (6) A further set of impact test at mid thickness for products with t〉40mm is required except rolled steels for hull structural in Rules Part 2, Chapter 1, 301 or high strength steels for welded structures in Rules Part 2, Chapter 1, 308. (7)~(9) 〈Same as the present Rules〉	

<table>
<tr><th>Present</th><th>Amendment</th><th>Reason</th></tr>
<tr>
<td>
Table 7.5.6 PLATES, SECTIONS AND FORGINGS(1) FOR CARGO TANKS, SECONDARY BARRIERS AND PROCESS PRESSURE VESSELS FOR DESIGN TEMPERATURES BELOW -55°C AND DOWN TO -165°C(2) Maximum thickness 25mm(3)(4) (2022) [See Guidance]
<table>
<tr><th>Minimum design temp.(°C)</th><th>Chemical composition and heat treatment</th><th>Impact test temp.(°C)</th></tr>
<tr><td>〈Omitted〉</td><td>〈Omitted〉</td><td>〈Omitted〉</td></tr>
<tr><td colspan="3">1. TENSILE AND TOUGHNESS(IMPACT) TEST REQUIREMENTS</td></tr>
<tr><td colspan="3">〈Omitted〉</td></tr>
<tr><td colspan="3">Notes :
(1)~(9) 〈Omitted〉
(10) A further set of impact test at mid thickness for products with t〉40mm is required except rolled steels ~~specified in Part 2~~.
(11) 〈Omitted〉</td></tr>
</table>
Table 7.5.7 ~ Table 7.5.8 〈Omitted〉

605. ~ 607. <Omitted>

Section 7 ~ Section 19 〈Omitted〉
</td>
<td>
Table 7.5.6 PLATES, SECTIONS AND FORGINGS(1) FOR CARGO TANKS, SECONDARY BARRIERS AND PROCESS PRESSURE VESSELS FOR DESIGN TEMPERATURES BELOW -55°C AND DOWN TO -165°C(2) Maximum thickness 25mm(3)(4) (2022) [See Guidance]
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</table>
Table 7.5.7 ~ Table 7.5.8 〈Same as the present Rules〉

605. ~ 607. <Same as the present Rules>

Section 7 ~ Section 19 〈Same as the present Rules〉
</td>
<td>- 문구 명확화
(Reflection of IACS UR W1-Rev.4)</td>
</tr>
</table>

Present	Amendment	Reason
[GUIDANCE] CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK Section 1 ~ Section 5 〈Omitted〉 Section 6 Materials of Construction and Quality Control 603. <Omitted> 604. Requirements for metallic materials 1. For the purpose of the requirements in Table 7.5.4 of the Rules, the following requirements are to be complied with : [See Rule] (1)~(3) 〈Omitted〉 ~~(4) For materials with the thickness of greater than 40mm and not more than 50mm, the impact test is to be carried out at the temperature of -30°C. (2018)~~ 2. ~ 5. 〈Omitted〉 605. ~ 606. <Omitted> Section 7 ~ Section 19 〈Omitted〉	**[GUIDANCE] CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK** Section 1 ~ Section 5 〈Same as the present Guidance〉 Section 6 Materials of Construction and Quality Control 603. <Same as the present Guidance> 604. Requirements for metallic materials 1. For the purpose of the requirements in Table 7.5.4 of the Rules, the following requirements are to be complied with : [See Rule] (1)~(3) 〈Same as the present Guidance〉 2. ~ 5. 〈Same as the present Guidance〉 605. ~ 606. <Same as the present Guidance> Section 7 ~ Section 19 〈Same as the present Guidance〉	- IACS UR W1-Rev.4 반영누락부분 수정

Present	Amendment	Reason
[GUIDANCE] CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK **Section 1 ~ Section 5 〈Omitted〉** **Section 6 Materials of Construction and Quality Control** **603. General test requirements and specifications [See Rule]** 1. Mechanical properties 〈Omitted〉 2. Alternative materials ~~When~~ the design temperature of a material falls under the higher temperature range than the specified one for the material ~~in~~ Table 7.5.4 ~~and~~ Table ~~7.5.5~~ of the Rules, the impact test temperature ~~given in Table 7.5.2 to Table 7.5.5 of the Rules~~ correspondingly to the design temperature may be used instead of the impact test temperature depending on the material. For example, in the case of 2.25% nickel steel pipes used at the design temperature of -45°C, the impact test temperature may be -50°C, while in the case of 3.5% nickel steel plates used at the design temperature of -61°C, the impact test temperature may be -70°C. 〈Below omitted〉	**[GUIDANCE] CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK** **Section 1 ~ Section 5 〈Same as the present Guidance〉** **Section 6 Materials of Construction and Quality Control** **603. General test requirements and specifications [See Rule]** 1. Mechanical properties 〈Same as the present Guidance〉 2. Alternative materials The design temperature of a material <u>may</u> falls under the higher temperature range than the specified one for the material <u>from</u> Table 7.5.4 <u>to</u> Table <u>7.5.7</u> of the Rules. <u>In this case,</u> the impact test temperature correspondingly to the design temperature may be used instead of the impact test temperature depending on the material. For example, in the case of 2.25% nickel steel pipes used at the design temperature of -45°C, the impact test temperature may be -50°C, while in the case of 3.5% nickel steel plates used at the design temperature of -61°C, the impact test temperature may be -70°C. <u>The impact test of austenitic stainless steel may be omitted, subject to agreement with the Society.</u> 〈Below same as the present Guidance〉	- 의미 명확화

Present	Amendment	Note
〈Guidance〉 Pt 7 CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK Section 4 Cargo Containment 423. Type C independent tanks 【See Rule】 3. Allowable stresses (2017) The circumferential stresses at supports shall be calculated by a procedure acceptable to the Classification Society for a sufficient number of load cases. (1) Permissible stresses in stiffening rings: 〈omit〉 Equivalent stress values σ_e is to be calculated over the full extent of the stiffening ring by a procedure acceptable to this Society, for a sufficient number of load cases as defined in **413. 9**, **414. 2** and **413.** of the Rules.	〈Guidance〉 Pt 7 CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK Section 4 Cargo Containment 423. Type C independent tanks 【See Rule】 3. Allowable stresses (2017) The circumferential stresses at supports shall be calculated by a procedure acceptable to the Classification Society for a sufficient number of load cases. (1) Permissible stresses in stiffening rings: 〈omit〉 Equivalent stress values σ_e is to be calculated over the full extent of the stiffening ring by a procedure acceptable to this Society, for a sufficient number of load cases as defined in **413. 9**, **414. 2** and **415.** of the Rules.	

Present	Amendment	Reason
[GUIDANCE] CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK **Section 1 ~ Section 5 〈Omitted〉** **Section 6 Materials of Construction and Quality Control** **603. General test requirements and specifications [See Rule]** 1. Mechanical properties 〈Omitted〉 2. Alternative materials ~~When~~ the design temperature of a material falls under the higher temperature range than the specified one for the material ~~in~~ Table 7.5.4 ~~and~~ Table ~~7.5.5~~ of the Rules, the impact test temperature ~~given in Table 7.5.2 to Table 7.5.5 of the Rules~~ correspondingly to the design temperature may be used instead of the impact test temperature depending on the material. For example, in the case of 2.25% nickel steel pipes used at the design temperature of -45°C, the impact test temperature may be -50°C, while in the case of 3.5% nickel steel plates used at the design temperature of -61°C, the impact test temperature may be -70°C. 3. Properties after post-weld heat treatment When post-weld heat treatment is carried out, the properties of the base material are to be in accordance with the requirements given in ~~Table 7.5.2 to Table 7.5.5~~ of the Rules in the heat treated condition or equivalent condition whether such post-weld heat treatment is regarded in **606.** or **504.** **6** (2) of the Rules or not. The welds properties at welding procedure qualification tests and production weld tests specified in the requirements in **605.** of the Rules are to satisfy the requirements in **605. 3** and **5** of the Rules in the heat treated condition. 〈Below omitted〉	**[GUIDANCE] CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK** **Section 1 ~ Section 5 〈Same as the present Guidance〉** **Section 6 Materials of Construction and Quality Control** **603. General test requirements and specifications [See Rule]** 1. Mechanical properties 〈Same as the present Guidance〉 2. Alternative materials The design temperature of a material may falls under the higher temperature range than the specified one for the material from Table 7.5.4 to Table 7.5.7 of the Rules. In this case, the impact test temperature correspondingly to the design temperature may be used instead of the impact test temperature depending on the material. For example, in the case of 2.25% nickel steel pipes used at the design temperature of -45°C, the impact test temperature may be -50°C, while in the case of 3.5% nickel steel plates used at the design temperature of -61°C, the impact test temperature may be -70°C. The impact test of austenitic stainless steel may be omitted, subject to agreement with the Society. 3. Properties after post-weld heat treatment When post-weld heat treatment is carried out, the properties of the base material are to be in accordance with the requirements given in **Table 7.5.4** to **Table 7.5.7** of the Rules in the heat treated condition or equivalent condition whether such post-weld heat treatment is regarded in **606.** or **504.** **6** (2) of the Rules or not. The welds properties at welding procedure qualification tests and production weld tests specified in the requirements in **605.** of the Rules are to satisfy the requirements in **605. 3** and **5** of the Rules in the heat treated 〈Below same as the present Guidance〉	- 의미 명확화

PART 8

Present	Amendment	Note
# 〈Guidance〉 Pt 8 # CHAPTER 7 CONTAINMENT OF FIRE ## Section 1 ~ 5 〈omitted〉 ## Section 6 Ventilation Systems 601. ~ 603. 〈omitted〉 605. Exhaust ducts from galley ranges 1. ~ 2. 〈omitted〉 3. In applying 605. 3 of the Rules, fire dampers do not need to pass the fire test in either Res. A. 754(18) or FTP code Annex 1 Part 3, but should be of steel and capable of stopping the draught. The requirements to “A” class applies only to the part of the duct outside of the galley. And the term"spaces containing combustible materials" will normally apply to all spaces in accommodation. 〈below omitted〉	# 〈Guidance〉 Pt 8 # CHAPTER 7 CONTAINMENT OF FIRE ## Section 1 ~ 5 〈same as the present〉 ## Section 6 Ventilation Systems 601. ~ 603. 〈same as the present〉 605. Exhaust ducts from galley ranges 1. ~ 2. 〈same as the present〉 3. In applying 605. 1 and 3 of the Rules, fire dampers do not need to pass the fire test in either Res. A. 754(18) or FTP code Annex 1 Part 3, but should be of steel and capable of stopping the draught. The requirements to “A” class applies only to the part of the duct outside of the galley. And the term"spaces containing combustible materials" will normally apply to all spaces in accommodation. 〈below omitted〉	- Reflection of omission of IACS UI SC 118(Rev.2)

Present	Amendment	Note
# 〈Rule〉 Pt 8 # CHAPTER 6 FIRE PROTECTION AND FIRE EXTINCTION ## Section 1 General **101. Application** 【See Guidance】 〈Omitted〉 **4. Application of requirements for tankers** *(2020)* (4) Tankers carrying petroleum products with a flashpoint exceeding 60 °C (closed cup test), as determined by an approved flashpoint apparatus, shall comply with the requirements provided in **Ch 8, 101. 4** (4) and Ch 8, 103. and the requirements for cargo ships other than tankers, except that, in lieu of the fixed fire extinguishing system required in **Ch 8, Sec.6**, they shall be fitted with a fixed deck foam system which shall comply with the provisions of the FSS Code.	# 〈Rule〉 Pt 8 # CHAPTER 6 FIRE PROTECTION AND FIRE EXTINCTION ## Section 1 General **101. Application** 【See Guidance】 〈Omitted〉 **4. Application of requirements for tankers** *(2020)* (4) Tankers carrying petroleum products with a flashpoint exceeding 60 °C (closed cup test), as determined by an approved flashpoint apparatus, shall comply with the requirements provided in **Ch 8, 101. 4** (4) and Ch 8, 902. 3 and the requirements for cargo ships other than tankers, except that, in lieu of the fixed fire extinguishing system required in **Ch 8, Sec.6**, they shall be fitted with a fixed deck foam system which shall comply with the provisions of the FSS Code.	

PART 9

Present	Amendment	Note
〈RULE〉 Part 9 **CHAPTER 9 CARGO VAPOUR EMISSION CONTROL SYSTEMS** **Section 5 Surveys** **503. Survey Assigned to Maintain Classification** **1. Annual survey** (1) For ships assigned with notation VEC1 and VEC2, the following items are to be surveyed. (H) Verification of the satisfactory operation of the following: (c) Cargo tank high level (d) Cargo tank overfill (not applicable for notation VEC1)	**〈RULE〉 Part 9** **CHAPTER 9 CARGO VAPOUR EMISSION CONTROL SYSTEMS** **Section 5 Surveys** **503. Survey Assigned to Maintain Classification** **1. Annual survey** (1) For ships assigned with notation VEC1 and VEC2, the following items are to be surveyed. (H) Verification of the satisfactory operation of the following: (c) Cargo tank overfill (d) Cargo tank high level (not applicable for notation VEC1)	- Cargo tank overfill is required for VEC1 & VEC2, and cargo tank high level is required for VEC2.

PART 10

Present	Amendment	Note
〈Guidance〉 Pt 10 CHAPTER 19 HATCHWAYS AND OTHER DECK OPENINGS Section 4 Hatchways Closed by Weathertight Covers fitted with Gaskets and Clamping Devices 401. Steel weathertight covers 【See Rule】 1. The details of gaskets and clamping devices for steel weathertight covers are to apply the provisions in **Pt 4, Ch 2, Sec 7** of the Rules. However, the standard spacings of securing devices are 0.5 m or less at the corner of the cover, and 1.0 m or less elsewhere.	〈Guidance〉 Pt 10 CHAPTER 19 HATCHWAYS AND OTHER DECK OPENINGS Section 4 Hatchways Closed by Weathertight Covers fitted with Gaskets and Clamping Devices 401. Steel weathertight covers 【See Rule】 1. The details of gaskets and clamping devices for steel weathertight covers are to apply the provisions in **Pt 4, Ch 2, Sec 5** of the Rules. However, the standard spacings of securing devices are 0.5 m or less at the corner of the cover, and 1.0 m or less elsewhere.	- errata

PART 13

Present	Amendment	Note
〈Rule〉 Pt 13 SUB-PART 1 GENERAL RULE REQUIREMENTS CHAPTER 4 LOADS SECTION 4 HULL GIRDER LOADS SYMBOLS f_β : Heading correction factor, to be taken as: • For strength assessment: f_β = 1.5 for HSM and FSM load cases for the extreme sea loads design load scenario. f_β = 0.8 for BSR and BSP load cases for the extreme sea loads design load scenario. f_β = 1.0 for HSA, OST and OSA load cases for the extreme sea loads design load scenario. f_β = 1.0 for ballast water exchange at sea, harbour/sheltered water and accidental flooded design load scenarios.	〈Rule〉 Pt 13 SUB-PART 1 GENERAL RULE REQUIREMENTS CHAPTER 4 LOADS SECTION 4 HULL GIRDER LOADS SYMBOLS f_β : Heading correction factor, to be taken as: • For strength assessment: f_β = 1.05 ~~1.5~~ for HSM and FSM load cases for the extreme sea loads design load scenario. f_β = 0.8 for BSR and BSP load cases for the extreme sea loads design load scenario. f_β = 1.0 for HSA, OST and OSA load cases for the extreme sea loads design load scenario. f_β = 1.0 for ballast water exchange at sea, harbour/sheltered water and accidental flooded design load scenarios.	- Typo

PART 15

Amendment	Note

Chapter 1 General Principles

Section 2 - Rule Principles

5. Rule design method

5.3 Load-capacity based requirements

Table 1 : Load scenarios and corresponding rule requirements

Operation	Load type	Design load scenario	Acceptance criteria
Seagoing operations			
...	...	...	...
Harbour and sheltered operations			
...	...	...	...
Accidental condition			
Accidental conditions	Maximum loads on internal watertight subdivision structure including cofferdams bulkhead in collision	A	AC-A
Flooded condition	Typically maximum loads on internal watertight subdivision structure in accidental flooded condition	A	AC-~~S~~A

5.4 Acceptance criteria

5.4.1

The acceptance criteria are categorized into five acceptance criteria sets. These are explained below and shown in **Table 2** and **Table 3**. The specific acceptance criteria set that is applied in the rule requirements is dependent on the probability level of the characteristic combined load.

a) The acceptance criteria set AC-S is applied for the static design load combinations~~, and for the sloshing design loads~~. The allowable stress for such loads is lower than that for an extreme load to take into account effects of:

- Repeated yield.
- Allowance for some dynamics.
- Margins for some selected limited operational mistakes.

[omitted]

Note: Typo. This amendment will be line with **Table 1** of **Ch 6, Sec 2**

Amendment	Note
Section 4 – Symbols and Definitions **2. Symbols** **2.1 Ship's main data** **2.1.1** **Table 3 : Ship's main data** Symbols | Meaning | Units ... | ... | ... T_{BAL} | Ballast draught (minimum at midship) | m ... | ... | ... **3. Definition** **3.1 Principal Particulars** **3.1.9 Lightweight** The lightweight is the ship displacement, in t, complete in all respects, but without cargo, consumable~~,~~ stores, ~~passengers and~~ crew and their effects, and without any liquids on board except that machinery and piping fluids, such as lubricants and hydraulics, are at operating levels. **Chapter 3 Structural Design Principles** **Section 1 – Materials** **2. Hull Structural Steel** **2.3 Steel grades**	

Amendment	Note

Table 5 : Minimum material grades for ships greater than 250 m in length

Structural member category[1]	Material grade
• Sheer strake at strength deck	Grade E/EH within 0.4 L amidships
• Stringer plate in strength deck	Grade E/EH within 0.4 L amidships
• Bilge strake	Grade D/DH within 0.4 L amidships

[1] Single strakes required to be of grade D/DH or grade E/EH as shown in the above table and within 0.4 L amidships are to have breadths not less than (800 + 5 L) mm, but need not be greater than 1800 mm, unless limited by the geometry of the ship's design.

Section 6 – Structural Detail Principles

2. General Principles

2.3 Connection of longitudinal members not contributing to the hull girder longitudinal strength

2.3.1

Where the hull girder stress at the strength deck and trunk deck or at the bottom as defined in **Ch 5, Sec 1, [2.1.2]** is higher than the permissible stress as defined in **Ch 5, Sec 1, [2.2.1]** for normal strength steel, longitudinal members not contributing to the hull girder longitudinal strength and welded to the strength deck or bottom plating and bilge ~~strake~~ plating, such as gutter bars, strengthening of deck openings, bilge keel, are to be made of steel with the same specified minimum yield stress as the strength deck or bottom structure steel.

5. Intersection of Stiffeners and Primary Supporting Members

5.2 Connection of stiffeners to PSM

5.2.7

Where the web stiffener of the PSM is parallel to the web of the intersecting stiffener, but not connected to it, the offset PSM web stiffener is to be located in close proximity to the slot edge as shown in **Figure 10**. The ends of the offset web stiffeners are to be suitably tapered and softened. ~~Locations where the web stiffener of the PSM are not connected to the intersecting stiffeners as well as the detail arrangements are to be specially considered on the basis of their ability to transmit load with equivalent effectiveness to that of **[5.2.2]** through **[5.2.6]**. Details of calculations made and/or testing procedures and results are to be submitted.~~

Amendment	Note
7. Double Bottom Structure **7.5 Bilge keel** **7.5.3 Ground bars** Bilge keels are not to be welded directly to the shell plating. A ground bar, or doubler, is to be fitted on the shell plating as shown in **Figure 16** and **Figure 17**. In general, the ground bar is to be continuous. The gross thickness of the ground bar is not to be less than the gross thickness of the bilge ~~strake~~ plating or 14 mm, whichever is the lesser. **Section 7 - Structural Idealisation** **Symbols** φ_w : Angle, in deg, between the stiffener or primary supporting member web and the attached plating, see **Figure 12** for stiffener and **Ch 10, Sec 1, Figure 5** for primary supporting member. φ_w is to be taken equal to or less than 90 deg ~~if the angle is greater than or equal to 75 deg~~. **1. Strucutral idealisation of stiffeners and primary support members** **1.4 Geometrical properties of stiffeners and primary supporting members** **1.4.3 Effective shear depth of stiffeners** [omitted] φ_w : Angle, in deg, as defined in **Figure 12.** φ_w is to be taken ~~as~~ equal to or less than 90 degrees ~~if the angle is greater than or equal to 75 degrees~~. **1.4.4 Elastic net section modulus of stiffeners** [omitted] φ_w : Angle, in deg, as defined in **Figure 12.** φ_w is to be taken ~~as~~ equal to or less than 90 degrees ~~if the angle is greater than or equal to 75 degrees~~.	

Amendment	Note

Chapter 8 Buckling

Section 2 - Slenderness Requirements

3. Stiffeners

3.1 Proportions of stiffeners

3.1.1 Bending stiffness of stiffeners

The net moment of inertia, in cm^4, of the stiffener with the effective width of attached plate, about the neutral axis parallel to the attached plating, s_{eff}, is not to be less than the minimum value given by:

[omitted]

6. Other structures

6.2 Edg reinforcement in way of openings

6.2.1 Depth of edge stiffener

When fitted as shown in **Figure 2**, the depth of web, h_w in mm, of edge stiffeners in way of openings is not to be less than:

$$h_w = C\ell\sqrt{\frac{R_{eH}}{235}}$$ or 50 mm, whichever is greater.

where:

C : Slenderness coefficient taken as:

$C = 50$

R_{eH} : Specified minimum yield stress of the edge stiffener material, in N/mm^2.

ℓ : Length of edge stiffener in way of opening, in m, as defined in **Figure 2**.

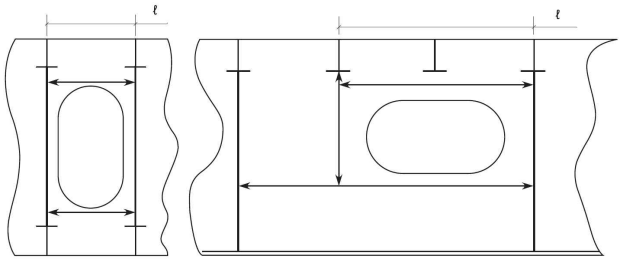
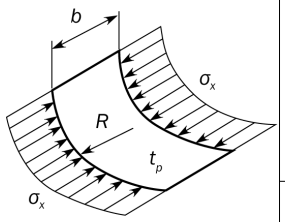
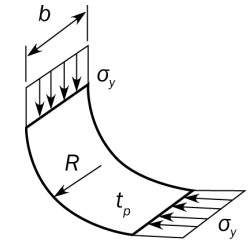
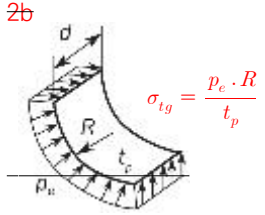


Figure 2 : Typical edge reinforcements

Amendment	Note
Section 5 - Buckling Capacity **2. Buckling Capacity of Plates and Stiffeners** **2.2 Plate capacity** **2.2.7 Bending stiffness of stiffeners** The normal stresses, σ_x and σ_y, in N/mm^2, to be applied for the plate panel capacity calculation as given in **[2.2.1]** are to be taken as follows: • For FE analysis, the reference stresses as defined in **Ch 8, Sec 4, [2.4]**. • For prescriptive assessment of the overall stiffened panel capacity and the plate panel capacity, the axial or transverse compressive stresses calculated according to **Ch 8, Sec 3, [2.2.1]**, at load calculation points of the considered stiffener or the considered elementary plate panel, as defined in **Ch 3, Sec 7, [3]** and **[2]** respectively. However, in case of transverse stiffening arrangement, the transverse compressive stress used for the assessment of the overall stiffened panel capacity is to be taken as the compressive stress calculated at load calculation points of the stiffener attached plating, as defined in **Ch 3, Sec 7, [2]**. • For grillage analysis where the stresses are obtained based on beam theory, the stresses taken as: $\sigma_x = \frac{\sigma_{xb} + \nu\sigma_{yb}}{1-\nu^2}$ $\sigma_y = \frac{\sigma_{yb} + \nu\sigma_{xb}}{1-\nu^2}$ where: σ_{xb}, σ_{yb} : Stress, in N/mm^2, from grillage beam analysis respectively along x or y axis of the attached ~~buckling panel~~ to the PSM web. The shear stress τ, in N/mm^2, to be applied for the plate panel capacity calculation as given in **[2.2.1]** are to be taken as follows • For FE analysis, the reference shear stresses as defined in **Ch 8, Sec 4, [2.4]**. • For prescriptive assessment, the shear stresses calculated according to **Ch 8, Sec 3, [2.2.1],** at load calculation points of the considered elementary plate panel, as defined in **Ch 3, Sec 7, [2]**. • For grillage beam analysis, $\tau = 0$ in the attached ~~buckling panel~~ to the PSM web. [omitted]	

Amendment	Note

Table 4 : Buckling Factor and reduction factor for curved plate panel with $R/t_p \leq 2500$

Case	Aspect ratio	Buckling factor K	Reduction factor C
1 	$\frac{d}{R} \leq 0.5\sqrt{\frac{R}{t_p}}$	$K = 1 + \frac{2}{3}\frac{d^2}{Rt_p}$	For general application: $C_{ax} = 1$ for $\lambda \leq 0.25$ $C_{ax} = 1.233 - 0.933\lambda$ for $0.25 < \lambda \leq 1$ $C_{ax} = 0.3/\lambda^3$ for $1 < \lambda \leq 1.5$ $C_{ax} = 0.2/\lambda^2$ for $\lambda > 1.5$ For curved single fields, e.g. bilge ~~strake~~ plating, which are bounded by plane panels: $C_{ax} = \frac{0.65}{\lambda^2} \leq 1.0$
	$\frac{d}{R} > 0.5\sqrt{\frac{R}{t_p}}$	$K = 0.267\frac{d^2}{Rt_p}[3 - \frac{d}{R}\sqrt{\frac{t_p}{R}}] \geq 0.4\frac{d^2}{Rt_p}$	
~~2a~~ 	$\frac{d}{R} \leq 1.63\sqrt{\frac{R}{t_p}}$	$K = \frac{d}{\sqrt{Rt_p}} + 3\frac{(Rt_p)^{0.175}}{d^{0.35}}$	For general application: $C_{tg} = 1$ for $\lambda \leq 0.4$ $C_{tg} = 1.274 - 0.686\lambda$ for $0.4 < \lambda \leq 1.2$ $C_{tg} = 0.65/\lambda^2$ for $\lambda > 1.2$ For curved single fields, e.g. bilge ~~strake~~ plating, which are bounded by plane panels: $C_{tg} = \frac{0.8}{\lambda^2} \leq 1.0$
~~2b~~  $\sigma_{tg} = \frac{p_e \cdot R}{t_p}$ ~~p_e = external pressure in [N/mm²]~~	$\frac{d}{R} > 1.63\sqrt{\frac{R}{t_p}}$	$K = 0.3\frac{d^2}{R^2} + 2.25(\frac{R^2}{dt_p})^2$	
...	...	...	...
...			

Amendment	Note
Chapter 10 Other Structures **Section 1 - Fore Part** **3. Structure subjected to impact loads** **3.3 Bow impact** **3.3.6 Primary supporting members** [omitted] g) The net web thickness of each primary supporting member, t_w, in mm, including decks/bulkheads ~~in way of~~ directly welded to the side shell is not to be less than: [omitted]	

OTHER RULES AND GUIDANCE

Amendments	Note

Guidance for Approval of Manufacturing Process and Type Approval, Etc.

CHAPTER 3 TYPE APPROVAL

Section 18 Mechanical Joints

1803. Type tests

1. Test items

Testing requirements for mechanical joints are to be as indicated in **Table 3.18.1**

Table 3.18.1 Test items for mechanical joints ***(2017)***

	Test items	Types of mechanical joints			Notes and references
		Compression couplings and pipes unions	Slip-on joints		
			Grip type & Machine grooved type	Slip type	
1	Tightness test	○	○	○	**Table 3.18.2**
2	Vibration (fatigue) test,	○	○	-	**Table 3.18.2**
3	Pressure pulsation test1)	○	○	-	**Table 3.18.2**
4	Burst pressure test	○	○	○	**Table 3.18.2**
5	Pull-out test	○	○	-	**Table 3.18.2**
6	Fire endurance test	○	○	○	**Table 3.18.2** (If required in **Pt 5, Ch 6, 104. 5**(5) of the Rules)
7	Vacuum test	○ 3)	○	○	~~1304. 7~~ Table 3.18.2 (for suction lines only)
8	Repeated assembly test	○ 2)	○	-	**Table 3.18.2**

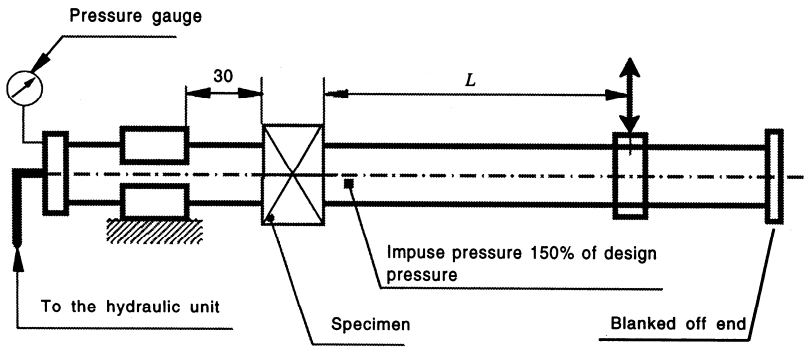
Abbreviations : ○ : test is required.
- : test is not required.

Footnotes
1) for use in those systems where pressure pulsation other than water hammer is expected.
2) except press type and swage type.
3) except joints with metal-to-metal tightening surfaces.

- Corrected in accordance with IACS UR P2.11

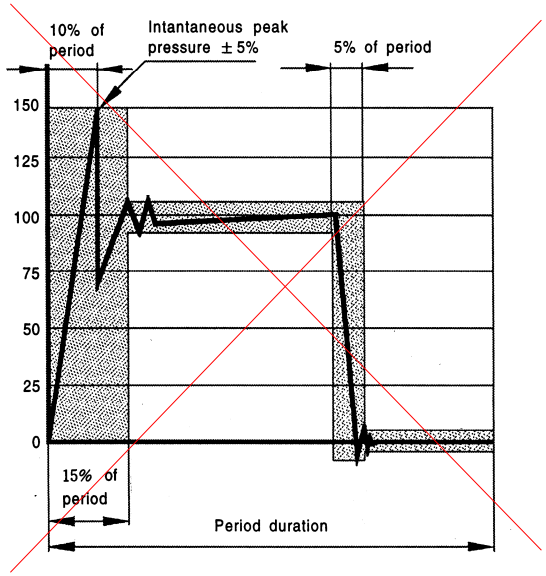
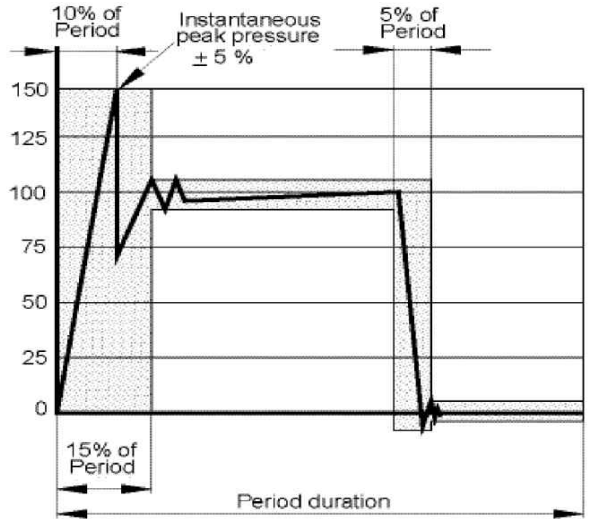
Amendments	Note

Table 3.18.2 The outlines of testing methods of mechanical joints (continued)

Test item	Kinds	Type test method
2. Vibration (fatigue) test	General	(1) In order to establish the capability of the mechanical joint assembly to withstand fatigue, which is likely to occur due to vibrations under service conditions, mechanical joint assemblies are to be subject to the following vibration test. (2) Conclusions of the vibration tests should show no leakage or damage.
	compression couplings, pipe unions	Compression couplings and, pipe unions intended for use in rigid pipe connections are to be tested as follows. (A) Two lengths of pipe is to be connected by means of the joint to be tested. (B) One end of the pipe is to be rigidly fixed while the other end is to be fitted to the vibration rig. (C) The test rig and the joint assembly specimen being tested ~~is~~are to be arranged as shown in Fig **3.18.1**  **Fig 3.18.1 Example of equipment for vibration(fatigue) test** 〈Omitted〉
	Grip type and Machine grooved type joints	〈Omitted〉

- Corrected in accordance with IACS UR P2.11

Amendments	Note
Table 3.18.2 The outlines of testing methods of mechanical joints (continued)	- Fig. 3.18.3 replaced in accordance with IACS UR P2.7.4 Rev.10

Test item	Kinds	Type test method
3. Pressure pulsation test	mechanical joint assembly	  **Fig 3.18.3 Example of Equipment for Pressure Pulsation Test**
4. Burst pressure test	mechanical joint assembly	〈Omitted〉
5. Pull-out test	mechanical joint assembly	〈Omitted〉

Amendments	Note

Table 3.18.2 The outlines of testing methods of mechanical joints (continued)

Test item	Kinds	Type test method
6. Fire endurance test	mechanical joint assembly	(1) In order to establish capability of the mechanical joints to withstand effects of fire which may be encountered in service, mechanical joints are to be subjected to a fire endurance test. The fire endurance test is to be conducted on the selected test specimens as per the following standards. (a) KS V ISO 19921: Ships and marine technology - Fire resistance of metallic pipe components with resilient and elastomeric seals - Test methods (b) KS V ISO 19922: Ships and marine technology - Fire resistance of metallic pipe components with resilient and elastomeric seals - Requirements imposed on the test bench. (2) Clarifications to the standard requirements in KS V ISO19921:2005, Paragraphs 7.2, 7.4, 7.6 and 7.7: (a) If the fire test is conducted with circulating water at a pressure different from the design pressure of the joint (however of at least 5 bar) the subsequent pressure test is to be carried out to ~~twice~~ 1.5 times the design pressure. (b) If the fire test is required in ~~Table 7~~ Pt.5 Ch.6 Section 1 Table 5.6.10 of Rules for the Classification of Steel Ships to be "8 min dry + 22 min wet" or "30 min dry", i.e. conducted for a period of time without circulating of water, the following test conditions apply:. (i) Test condition "8 min dry + 22 min wet" The test piece is not required to be rinsed with the test medium (water) in preparation for the test as required in Paragraph 7.2 of KS V ISO 19921:2005. The exposure to fire is to be started and continued for 8 minutes with the sample dry; after 8 minutes of dry test condition the piping system is to be filled with water and test pressure is to be increased up to at least 5 bar within 2 minutes, then maintained to at least 5 bar. After further 22 minutes (i.e. 30 minutes from initial exposure to fire) the exposure to fire is to be stopped and a hydrostatic pressure test as specified in ~~1.~~ (a) is to be carried out. (ii) Test condition "30 min dry" The exposure to fire is to be started and continued for 30 minutes with the sample dry. After 30 minutes the exposure to fire is to be stopped and a hydrostatic pressure test as specified in ~~1.~~ (a) is to be carried out. 〈Note〉 For fire tests in dry condition the pressure inside the test specimen is to be monitored for a rise due to heating of the enclosed air. Means of pressure relief should be provided where deemed necessary. High pressures created during this test can result in failure of the test specimen. Precautions shall be taken to protect personnel and facilities. Paragraph 7.5 of KS V ISO 19921:2005 does not apply to the dry tests and no forced air circulation is to be arranged. For fire endurance test requiring exposure time greater than 30 minutes test conditions are adjusted to meet the extended required total exposure time. In all cases for dry-wet test the minimum dry test exposure time is 8 minutes.

- Corrected in accordance with IACS UR P2.11 and KR Rule

Amendments	Note

Table 3.18.2 The outlines of testing methods of mechanical joints (continued)

Test item	Kinds	Type test method
6. Fire endurance test	mechanical joint assembly	(c) A selection of representative nominal bores may be tested in order to evaluate the fire resistance of a series or range of mechanical joints of the same design. When a mechanical joint of a given nominal bore (Dn) is so tested then other mechanical joints falling in the range Dn to 2xDn (both inclusive) are considered accepted. (d) Alternative test methods and/or test procedures considered to be at least equivalent may be accepted at the discretion of the Classification Society in cases where the test pieces are too large for the test bench and cannot be completely enclosed by the flames. (e) Where thermal insulation is acceptable as a means of providing fire resistance, following requirements apply: (i) Thermal insulation materials applied on couplings are to be non-combustible in dry condition and when subjected to oil spray. A non-combustibility test according to ISO 1182:2010 is to be carried out as required by the Fire Test Procedures Code defined in Regulation 3 of SOLAS Chapter II-2 as amended by IMO resolutions up to MSC.421(98). Precautions are to be taken to protect the insulation from being impregnated with flammable oils. (ii) At least the fire endurance and the vibration testing in ~~table 9~~ table 3.18.1 are to be carried out with thermal insulation in place. (iii) A service restriction is to be stated on the type approval certificate that the mechanical joints are to be fitted with thermal insulation during the installation in cases where the mechanical joints are used where fire resistance is required, unless mechanical joints are delivered already fitted with thermal insulation before installation.
7. Vacuum test	mechanical joint assembly	In order to establish the capability of the mechanical joint assembly to withstand internal pressures below atmospheric similar to the conditions likely to be encountered under service conditions, the following vacuum test is to be carried out. (1) The mechanical joint assembly is to be connected to a vacuum pump and subjected to a pressure of 170 hPa absolute. (2) Once this pressure is stabilized, the specimen under test ~~are~~ is to be isolated from the vacuum pump and the pressure is to be maintained for a period of 5 minutes. (3) No internal pressure rise is permitted.
8. Repeated assembly test	mechanical joint assembly	The mechanical joint test specimen is to be dismantled and reassembled 10 times in accordance with manufacturer's instructions and then subjected to a tightness test as defined in **1 of this Table.**

- Corrected in accordance with IACS UR P2.11 and KR Rule

Current

〈Guidance for Approval of Manufacturing Process and Type Approval, Etc.〉

CHAPTER 3 TYPE APPROVAL

Section 25 Securing Devices

2502. Type tests

1. Type tests to determine the breaking or proof loads are to be carried out on at least two samples of each item used in the securing system. The relationship between minimum design breaking load and safe working load is to be as indicated in **Table 3.25.1.**

Table 3.25.1 Design Braking Loads and Proof Loads *(2022)*

Item			Min. design breaking load (kN)		Min. proof load (kN)	
			$SWL \leq 400$	$SWL > 400$	$SWL \leq 400$	$SWL > 400$
Lashings	Wire ripe		3 × SWL	–	–	–
	Rod	mild steel	3 × SWL		1.5 × SWL	
		higher tensile steel	2 × SWL		1.5 × SWL	
	Chain	mild steel	3 × SWL		–	
		higher tensile steel	2.5 × SWL			
Fittings and securing devices			2 × SWL	SWL+ 400	1.5 × SWL	SWL+ 200

NOTES:
1. Higher tensile steel is defined for this purpose as steel having a yield stress not less than 315 $\mathrm{N/mm^2}$
2. 〈omit〉

Amendment

〈Guidance for Approval of Manufacturing Process and Type Approval, Etc.〉

CHAPTER 3 TYPE APPROVAL

Section 25 Securing Devices

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			$SWL \leq 400$	$SWL > 400$	$SWL \leq 400$	$SWL > 400$
Lashings	Wire ripe		3 × SWL	–	–	–
	Rod	mild steel	2 × SWL		1.5 × SWL	
		higher tensile steel	2 × SWL		1.5 × SWL	
	Chain	mild steel	2.5 × SWL		–	
		higher tensile steel	3 × SWL			
Other securing devices			2 × SWL	SWL+ 400	1.5 × SWL	SWL+ 200

NOTES:
1. Higher tensile steel is defined for this purpose as steel having a yield stress not less than 315 $\mathrm{N/mm^2}$
2. 〈same as current〉

Note

- error (table 2.25. 2): refer LR rule

Present	Amendment	Reason
Rules and Guidances for the Classification of Ships Using Low-flashpoint Fuels **[RULE] CHAPTER 1 ~ CHAPTER 6 〈Omitted〉** **CHAPTER 7 MATERIAL AND GENERAL PIPE DESIGN** Section 1 ~ Section 3 〈Omitted〉 Section 4 Materials 401. Metallic materials 1. ~ 6. 〈Omitted〉 Table 7.1 PLATES, PIPES (SEAMLESS AND WELDED)(1)(2), SECTIONS AND FORGINGS FOR FUEL TANKS AND PROCESS PRESSURE VESSELS FOR DESIGN TEMPERATURES NOT LOWER THAN 0°C. (2022) [See Guidance]	**Rules and Guidances for the Classification of Ships Using Low-flashpoint Fuels** **[RULE] CHAPTER 1 ~ CHAPTER 6 〈Same as the present Rules〉** **CHAPTER 7 MATERIAL AND GENERAL PIPE DESIGN** Section 1 ~ Section 3 〈Same as the present Rules〉 Section 4 Materials 401. Metallic materials 1. ~ 6. 〈Same as the present Rules〉 Table 7.1 PLATES, PIPES (SEAMLESS AND WELDED)(1)(2), SECTIONS AND FORGINGS FOR FUEL TANKS AND PROCESS PRESSURE VESSELS FOR DESIGN TEMPERATURES NOT LOWER THAN 0°C. (2022) [See Guidance]	- 문구 명확화 (Reflection of IACS UR W1-Rev.4)

1. CHEMICAL COMPOSITION AND HEAT TREATMENT
〈Omitted〉
2. TENSILE AND TOUGHNESS(IMPACT) TEST REQUIREMENTS
〈Omitted〉
Notes : (1)~(5) 〈Omitted〉 (6) A further set of impact test at mid thickness for products with t〉40mm is required except rolled steels ~~specified in Part 2~~. (7)~(8) 〈Omitted〉

1. CHEMICAL COMPOSITION AND HEAT TREATMENT
〈Same as the present Rules〉
2. TENSILE AND TOUGHNESS(IMPACT) TEST REQUIREMENTS
〈Same as the present Rules〉
Notes : (1)~(5) 〈Same as the present Rules〉 (6) A further set of impact test at mid thickness for products with t〉40mm is required except rolled steels <u>for hull structural in Rules Part 2, Chapter 1, 301 or high strength steels for welded structures in Rules Part 2, Chapter 1, 308</u>. (7)~(8) 〈Same as the present Rules〉

Present	Amendment	Reason
Table 7.2a PLATES, SECTIONS AND FORGINGS[1] FOR FUEL TANKS, SECONDARY BARRIERS AND PROCESS PRESSURE VESSELS FOR DESIGN TEMPERATURES BELOW 0°C AND DOWN TO -10°C, Maximum thickness 25mm[2] (2022) [See Guidance]	Table 7.2a PLATES, SECTIONS AND FORGINGS[1] FOR FUEL TANKS, SECONDARY BARRIERS AND PROCESS PRESSURE VESSELS FOR DESIGN TEMPERATURES BELOW 0°C AND DOWN TO -10°C, Maximum thickness 25mm[2] (2022) [See Guidance]	- 문구 명확화 (Reflection of IACS UR W1-Rev.4)
1. CHEMICAL COMPOSITION AND HEAT TREATMENT 〈Omitted〉 2. TENSILE AND TOUGHNESS(IMPACT) TEST REQUIREMENTS 〈Omitted〉 Notes : (1)~(5) 〈Omitted〉 (6) A further set of impact test at mid thickness for products with t〉40mm is required except rolled steels specified in Part 2. (7)~(9) 〈Omitted〉	1. CHEMICAL COMPOSITION AND HEAT TREATMENT 〈Same as the present Rules〉 2. TENSILE AND TOUGHNESS(IMPACT) TEST REQUIREMENTS 〈Same as the present Rules〉 Notes : (1)~(5) 〈Same as the present Rules〉 (6) A further set of impact test at mid thickness for products with t〉40mm is required except rolled steels for hull structural in Rules Part 2, Chapter 1, 301 or high strength steels for welded structures in Rules Part 2, Chapter 1, 308. (7)~(9) 〈Same as the present Rules〉	
Table 7.2b PLATES, SECTIONS AND FORGINGS[1] FOR FUEL TANKS, SECONDARY BARRIERS AND PROCESS PRESSURE VESSELS FOR DESIGN TEMPERATURES BELOW -10°C AND DOWN TO -55°C. Maximum thickness 25mm[2] (2022) [See Guidance]	Table 7.2b PLATES, SECTIONS AND FORGINGS[1] FOR FUEL TANKS, SECONDARY BARRIERS AND PROCESS PRESSURE VESSELS FOR DESIGN TEMPERATURES BELOW -10°C AND DOWN TO -55°C. Maximum thickness 25mm[2] (2022) [See Guidance]	
1. CHEMICAL COMPOSITION AND HEAT TREATMENT 〈Omitted〉 2. TENSILE AND TOUGHNESS(IMPACT) TEST REQUIREMENTS 〈Omitted〉 Notes : (1)~(5) 〈Omitted〉 (6) A further set of impact test at mid thickness for products with t〉40mm is required except rolled steels ~~specified in Part 2~~. (7)~(9) 〈Omitted〉	1. CHEMICAL COMPOSITION AND HEAT TREATMENT 〈Same as the present Rules〉 2. TENSILE AND TOUGHNESS(IMPACT) TEST REQUIREMENTS 〈Same as the present Rules〉 Notes : (1)~(5) 〈Same as the present Rules〉 (6) A further set of impact test at mid thickness for products with t〉40mm is required except rolled steels for hull structural in Rules Part 2, Chapter 1, 301 or high strength steels for welded structures in Rules Part 2, Chapter 1, 308. (7)~(9) 〈Same as the present Rules〉	

<table>
<tr><th>Present</th><th>Amendment</th><th>Reason</th></tr>
<tr>
<td>
Table 7.3 PLATES, SECTIONS AND FORGINGS(1) FOR FUEL TANKS, SECONDARY BARRIERS AND PROCESS PRESSURE VESSELS FOR DESIGN TEMPERATURES BELOW -55°C AND DOWN TO -165°C(2) Maximum thickness 25mm(3)(4) (2022) [See Guidance]
<table>
<tr><th>Minimum design temp.(°C)</th><th>Chemical composition and heat treatment</th><th>Impact test temp.(°C)</th></tr>
<tr><td>〈Omitted〉</td><td>〈Omitted〉</td><td>〈Omitted〉</td></tr>
<tr><td colspan="3">1. TENSILE AND TOUGHNESS(IMPACT) TEST REQUIREMENTS</td></tr>
<tr><td colspan="3">〈Omitted〉</td></tr>
<tr><td colspan="3">Notes :
(1)~(9) 〈Omitted〉
(10) A further set of impact test at mid thickness for products with t〉40mm is required except rolled steels ~~specified in Part 2~~.
(11) 〈Omitted〉</td></tr>
</table>
Table 7.4 ~ Table 7.5 〈Omitted〉

CHAPTER 8 ~ CHAPTER 18 〈Omitted〉
</td>
<td>
Table 7.3 PLATES, SECTIONS AND FORGINGS(1) FOR FUEL TANKS, SECONDARY BARRIERS AND PROCESS PRESSURE VESSELS FOR DESIGN TEMPERATURES BELOW -55°C AND DOWN TO -165°C(2) Maximum thickness 25mm(3)(4) (2022) [See Guidance]
<table>
<tr><th>Minimum design temp.(°C)</th><th>Chemical composition and heat treatment</th><th>Impact test temp.(°C)</th></tr>
<tr><td>〈Same as the present Rules〉</td><td>〈Same as the present Rules〉</td><td>〈Same as the present Rules〉</td></tr>
<tr><td colspan="3">1. TENSILE AND TOUGHNESS(IMPACT) TEST REQUIREMENTS</td></tr>
<tr><td colspan="3">〈Same as the present Rules〉</td></tr>
<tr><td colspan="3">Notes :
(1)~(9) 〈Same as the present Rules〉
(10) A further set of impact test at mid thickness for products with t〉40mm is required except rolled steels <u>for hull structural in Rules Part 2, Chapter 1, 301 or high strength steels for welded structures in Rules Part 2, Chapter 1, 308</u>.
(11) 〈Same as the present Rules〉</td></tr>
</table>
Table 7.4 ~ Table 7.5 〈Same as the present Rules〉

CHAPTER 8 ~ CHAPTER 18 〈Same as the present Rules〉
</td>
<td>- 문구 명확화 (Reflection of IACS UR W1-Rev.4)</td>
</tr>
</table>

Present	Correction	Reason
〈Rules and Guidance for the Classification of High Speed and Light Crafts〉 PART 3 HULL STRUCTURES CHAPTER 1 DESIGN PRINCIPLES Section 4 Subdivision and Arrangement 401. ~ 405. 〈omission〉 406. Hydrostatic and watertight tests In the Classification Survey during Construction, hydrostatic and watertight tests are to be carried out in accordance with ~~Pt 3, Ch 1, 209.~~ of ~~Rules for the Classification of Steel Ship~~.∀ 407. ~ 411. 〈omission〉 ⚓	〈Rules and Guidance for the Classification of High Speed and Light Crafts〉 PART 3 HULL STRUCTURES CHAPTER 1 DESIGN PRINCIPLES Section 4 Subdivision and Arrangement 401. ~ 405. 〈same as present〉 406. Hydrostatic and watertight tests In the Classification Survey during Construction, hydrostatic and watertight tests are to be carried out in accordance with Pt 1, Annex-16 Procedures for Testing Tanks and Tight Boundaries 407. ~ 411. 〈same as present〉 ⚓	-Typo

Present	Reason
# 〈Guidance for Ship for Navigation in Ice〉 ## CHAPTER 2 SHIPS FOR NAVIGATION IN POLAR WATERS ### Section 2 Structural Requirements for Polar Class Ships **201. ~ 204. 〈omission〉** **205. Framing** **1. General** (1) ~ (8) 〈omission〉 (9) When the cross-sectional area of the frame exceeds the cross-sectional area of the attached plate flange, the plastic neutral axis is located a distance ~~z_{na}~~ above the shell plate, given by: *(2017)* $Z_{na} = (100A_{fn} + h_w t_{wn} - 1000 t_{pm} S)/(2 t_{wn})$ (mm) and the net effective plastic section modulus, Z_p transverse or longitudial frame is given by: $Z_p = t_{pm} S\left(Z_{na} + \frac{t_{pm}}{2}\right)\sin\varphi_w + \left(\frac{((h_w - Z_{na})^2 + Z_{na}^2) t_{wn} \sin\varphi_w}{2000} + \frac{A_{fn}((h_{fc} - Z_{na})\sin\varphi_w - b_w \cos\varphi_w)}{10}\right)$ (cm^3) (10) 〈omission〉 **2. Local frames in bottom structures and transverse local frame in side structures** (1) 〈omission〉 (2) The actual net effective shear area of the frame, A_w is shall not be less than the following calculation: ~~A_t~~ $= 100^2 \times 0.5 \times LL \times S \times (AF \times PPF \times P_{avg})/(0.577\sigma_y)$ (cm^2) where LL = length of loaded portion of span = lesser of a and b (m) a = local frame span (m) b = height of design ice load patch as defined in **203. 3** (1) or (2) (m) S = local frame spacing (m) AF = hull area factor from **Table 2.4** or **Table 2.4-1** PPF= peak pressure factor, PPF_t or PPF_s as appropriate from **Table 2.3** P_{avg} = average pressure within load patch as defined in **203. 4** (1) (MPa) σ_y = minimum yield stress of the material (N/mm^2)	-Typo(lowercase to uppercase) -Typo

Present	Reason
(3) The actual net effective plastic section ~~modules~~ of the frame, Z_p is shall not be less than the following calculation(where Z_{pm} is to be the greater calculated on the basis of following two load conditions). The A_1 parameter in the equation reflects the two conditions: *(2017)* (a) ice load acting at the midspan of the local frame. (b) ice load acting near a support. ⚓	-Typo (English only)

Correction	Reason

CHAPTER 2 SHIPS FOR NAVIGATION IN POLAR WATERS

Section 2 Structural Requirements for Polar Class Ships

201. ~ 204. 〈omission〉

205. Framing

1. General

(1) ~ (8) 〈same as present〉

(9) When the cross-sectional area of the frame exceeds the cross-sectional area of the attached plate flange, the plastic neutral axis is located a distance Z_{na} above the shell plate, given by: *(2017)*

$$Z_{na} = (100A_{fn} + h_w t_{wn} - 1000 t_{pm} S)/(2 t_{wn}) \ \text{(mm)}$$

and the net effective plastic section modulus, Z_p transverse or longitudial frame is given by:

$$Z_p = t_{pm} S\left(Z_{na} + \frac{t_{pm}}{2}\right)\sin\varphi_w + \left(\frac{((h_w - Z_{na})^2 + Z_{na}^2) t_{wn} \sin\varphi_w}{2000} + \frac{A_{fn}((h_{fc} - Z_{na})\sin\varphi_w - b_w \cos\varphi_w)}{10}\right) \ (\text{cm}^3)$$

(10) 〈same as present〉

2. Local frames in bottom structures and transverse local frame in side structures

(1) 〈same as present〉

(2) The actual net effective shear area of the frame, A_w is shall not be less than the following calculation:

$$A_w = 100^2 \times 0.5 \times LL \times S \times (AF \times PPF \times P_{avg})/(0.577\sigma_y) \ (\text{cm}^2) \qquad (\text{cm}^2)$$

where

LL = length of loaded portion of span

= lesser of a and b (m)

a = local frame span (m)

b = height of design ice load patch as defined in **203. 3** (1) or (2) (m)

S = local frame spacing (m)

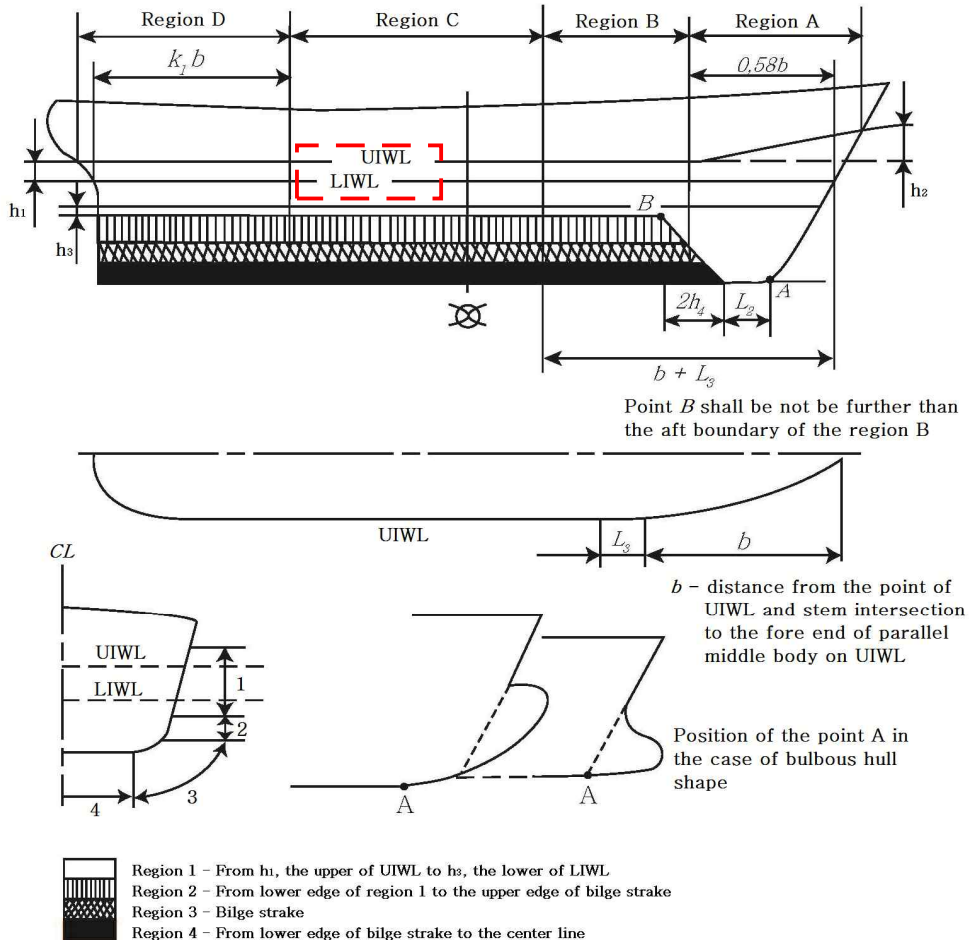
AF = hull area factor from **Table 2.4** or **Table 2.4-1**

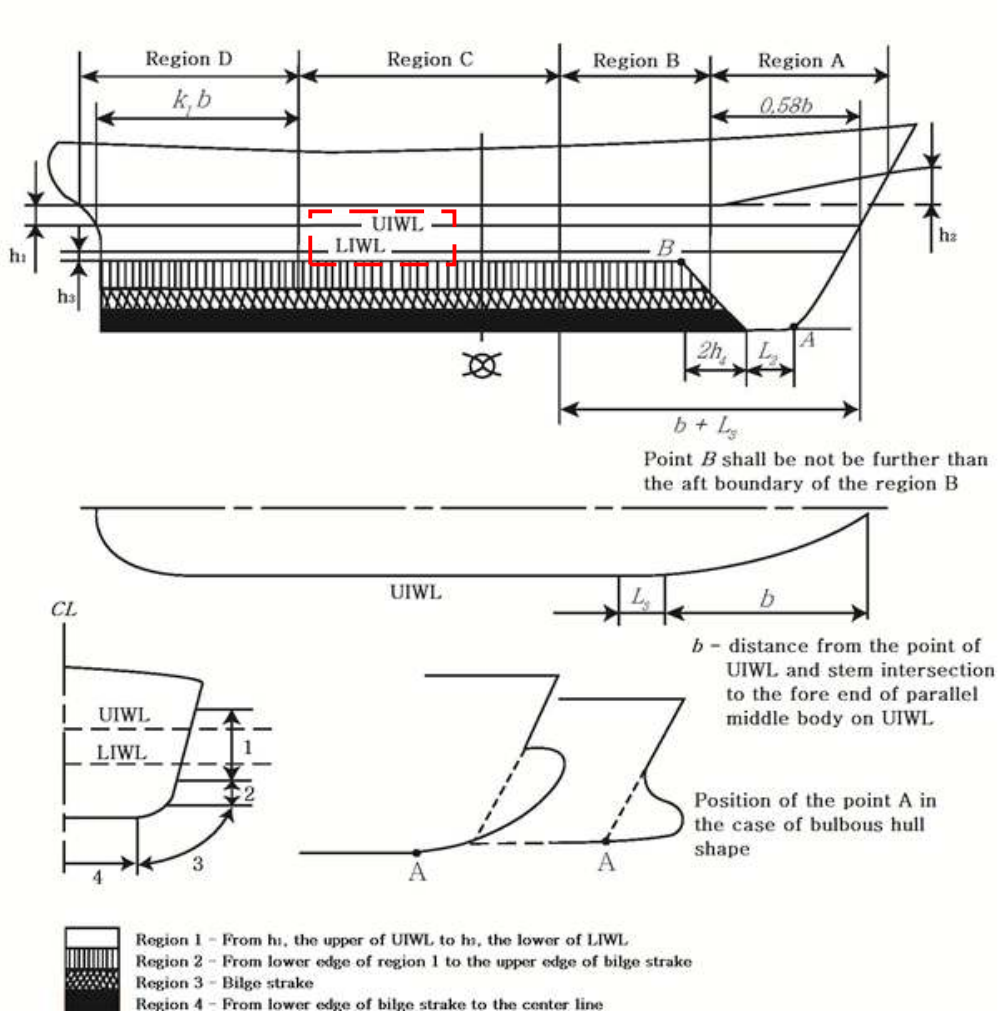
PPF= peak pressure factor, PPF_t or PPF_s as appropriate from **Table 2.3**

P_{avg} = average pressure within load patch as defined in **203. 4** (1) (MPa)

σ_y = minimum yield stress of the material (N/mm^2)

Correction	Reason
(3) The actual net effective plastic section modulus of the frame, Z_p is shall not be less than the following calculation(where Z_{pm} is to be the greater calculated on the basis of following two load conditions). The A_1 parameter in the equation reflects the two conditions: *(2017)* (a) ice load acting at the midspan of the local frame. (b) ice load acting near a support. ⚓	

Present	Reason
# CHAPTER 3 SHIPS WITH ICE BREAKING CAPABILITY FOR NAVIGATION IN POLAR WATERS Fig 3.7 Region of ice strengthening of Arctic class ships  Fig 3.7 Region of ice strengthening of Arctic class ships	– Typo

Correction	Reason
Fig 3.7 Region of ice strengthening of Arctic class ships  	

Present	Correction	Reason
CHAPTER 3 SHIPS WITH ICE BREAKING CAPABILITY FOR NAVIGATION IN POLAR WATERS	CHAPTER 3 SHIPS WITH ICE BREAKING CAPABILITY FOR NAVIGATION IN POLAR WATERS	
Table 3.17 The value of a_1, a_2, a_3, a_4	Table 3.17 The value of a_1, a_2, a_3, a_4	- Typo

Arctic class	Arctic4	Arctic5	Arctic6	Arctic7	Arctic8	Arctic9
a_1	0.79	1.15	1.89	2.95	5.3	7.9
a_2	0.80	1.17	1.92	3.06	5.75	8.95
a_3	0.50	0.78	1.2	~~1.2~~	3.7	5.6
a_4	0.75	0.87	1.0	-	-	-

Arctic class	Arctic4	Arctic5	Arctic6	Arctic7	Arctic8	Arctic9
a_1	0.79	1.15	1.89	2.95	5.3	7.9
a_2	0.80	1.17	1.92	3.06	5.75	8.95
a_3	0.50	0.78	1.2	1.84	3.7	5.6
a_4	0.75	0.87	1.0	-	-	-

Present	Correction	Reason
〈Guidance for Ship for Navigation in Ice〉 **CHAPTER 3 SHIPS WITH ICE BREAKING CAPABILITY FOR NAVIGATION IN POLAR WATERS** **Section 2 Strengthening of Arctic class ships and Icebreakers** **201. ~ 208. 〈omission〉** **209. Conventional frames where transverse framing is used** The requirements of this paragraph apply to conventional frames, main frame and deep frame in grillages where transverse framing is used. In the case of main framing, the requirements shall be applied to a single span of a conventional frame which lies between the supporting sections of the frame on the upper and lower supporting structures. In the case of web frames, the requirements shall be applied to all the spans of a conventional frame. 1. The ultimate section modulus ~~Z~~(cm^3), of a conventional frame shall not be less than determined by the formula. ~~$Z = kZ_0$~~ (cm^3) where ~~$k = \frac{1}{F+0.15j}$~~ F = 1 with $CF = 4$ F = 0.5 with $CF < 4$ CF = refer to **Table 3.28** for grillage with main framing CF = 4 for grill ages with web framing j = factor equal to : the number of fixed supporting sections of two adjacent frames $j \leq 4$ as far as grillage with main framing are concerned, in the case of grillage with web framing, refer to **Table 3.28** ~~$Z_0 = 1.15\frac{250}{\sigma_y} pbal\ Yk_k E$~~	〈Guidance for Ship for Navigation in Ice〉 **CHAPTER 3 SHIPS WITH ICE BREAKING CAPABILITY FOR NAVIGATION IN POLAR WATERS** **Section 2 Strengthening of Arctic class ships and Icebreakers** **201. ~ 208. 〈omission〉** **209. Conventional frames where transverse framing is used** The requirements of this paragraph apply to conventional frames, main frame and deep frame in grillages where transverse framing is used. In the case of main framing, the requirements shall be applied to a single span of a conventional frame which lies between the supporting sections of the frame on the upper and lower supporting structures. In the case of web frames, the requirements shall be applied to all the spans of a conventional frame. 1. The ultimate section modulus Z_f(cm^3), of a conventional frame shall not be less than determined by the formula. $Z_f = k_f Z_{f0}$ (cm^3) where $k_f = \frac{1}{F+0.15j}$ F = 1 with $CF = 4$ F = 0.5 with $CF < 4$ CF = refer to **Table 3.28** for grillage with main framing CF = 4 for grill ages with web framing j = factor equal to : the number of fixed supporting sections of two adjacent frames $j \leq 4$ as far as grillage with main framing are concerned, in the case of grillage with web framing, refer to **Table 3.28** $Z_{f0} = 1.15\frac{250}{\sigma_y} pbal\ Yk_k E$	– typo – typo

Present	Correction	Reason
p = ice load(kPa) in the region under consideration in accordance with **206. 3.** or **206. 6.** where the lower boundary of region 1 is included in the grillage and this requirements cover region of ice strengthening 1 and 2, the following values of p shall be adopted $p = p_{k1}$, if the distance from the plating of the upper supporting structure of the grillage to the lower boundary of region 1 is greater than 1.2b, other wise p = p_{k2}	p = ice load(kPa) in the region under consideration in accordance with **206. 3.** or **206. 6.** where the lower boundary of region 1 is included in the grillage and this requirements cover region of ice strengthening 1 and 2, the following values of p shall be adopted $p = p_{k1}$, if the distance from the plating of the upper supporting structure of the grillage to the lower boundary of region 1 is greater than 1.2b, other wise p = p_{k2}	
p_{k1}, p_{k2} = ice load in regions 1 and 2(refer to **206. 3.**)	p_{k1}, p_{k2} = ice load in regions 1 and 2(refer to **206. 3.**)	
b = vertical distribution(m) of ice load in the region under consideration in accordance with **206. 3.** or **206. 6.** if b 〉 l, b = 1 shall be adopted for the purpose of determining Z_{f0} and A_f	b = vertical distribution(m) of ice load in the region under consideration in accordance with **206. 3.** or **206. 6.** if b 〉 l, b = 1 shall be adopted for the purpose of determining Z_{f0} and A_f	
a = conventional frame spacing(m) as measured at side	a = conventional frame spacing(m) as measured at side	
l = considered frame span(m) to be determined in accordance with **Table 3.28** in the case of main framing and with **Table 3.29** in the case of web framing	l = considered frame span(m) to be determined in accordance with **Table 3.28** in the case of main framing and with **Table 3.29** in the case of web framing	
~~$Y = 1 - 0.5\frac{b}{l}$~~	$Y = 1 - 0.5\beta$, $\beta = \frac{b}{l}$ $(\beta \leq 1)$	– typo
k_k = factor equal to 0.9 for conventional frames joined with knees to bearing stringers in a side grillage with deep frames, and equal to 1.0 in other cases	k_k = factor equal to 0.9 for conventional frames joined with knees to bearing stringers in a side grillage with deep frames, and equal to 1.0 in other cases	
E = factor equal to :	E = factor equal to :	
$E = 4l_i\frac{l - l_i}{l^2}$ with $l_i < 0.5l$	$E = 4l_i\frac{l - l_i}{l^2}$ with $l_i < 0.5l$	
~~$E = l$~~ with $l_i \geq 0.5l$	$E = 1$ with $l_i \geq 0.5l$	– typo
where l_i = section of the span length l(m) overlapped by the region of ice strengthening	where l_i = section of the span length l(m) overlapped by the region of ice strengthening	

Present	Correction	Reason
2. The web area ~~A~~(cm^2) of a conventional frame shall not be less than determined by the formula. ~~A~~ $= \frac{8.7pab}{\sigma_y} k_2 k_3 k_4 + 0.1 d_w \Delta t$ (cm^2) where ~~$k_2 = \frac{4}{k}$~~ $k_3 = \frac{1}{1+z+\sqrt{2z}\,\beta^{2.5}}$ or $k_3 = 0.7$, whichever is greater. $z = \frac{1}{2\beta}(a/l)^2$ p, a, b, l, k, β = refer to **Par 1**, the values of b and l adopted shall not exceed he distance between bracket ends k_4 = 1 – where no side stringer is provided 0.9 – where there is a side stringer in the span d_w = frame web height(cm), $d_w = 0.89d$ for symmetric bulb and $d_w = 0.84d$ for asymmetric bulb d = rolled profile height(cm) $\triangle t$= additional thickness(mm) for corrosion wear, 2.5 for deep tanks and 1.5 for other regions **3.** The actual web area A (cm^2), shall be determined in accordance with **Ch 2, 205**.	**2.** The web area A_f(cm^2) of a conventional frame shall not be less than determined by the formula. $A_f = \frac{8.7pab}{\sigma_y} k_2 k_3 k_4 + 0.1 d_w \Delta t$ (cm^2) where $k_2 = \frac{4}{CF}$ $k_3 = \frac{1}{1+z+\sqrt{2z}\,\beta^{2.5}}$ or $k_3 = 0.7$, whichever is greater. $z = \frac{1}{2\beta}(a/l)^2$ p, a, b, l, k, β = refer to **Par 1**, the values of b and l adopted shall not exceed he distance between bracket ends k_4 = 1 – where no side stringer is provided 0.9 – where there is a side stringer in the span d_w = frame web height(cm), $d_w = 0.89d$ for symmetric bulb and $d_w = 0.84d$ for asymmetric bulb d = rolled profile height(cm) $\triangle t$= additional thickness(mm) for corrosion wear, 2.5 for deep tanks and 1.5 for other regions **3.** The actual web area A (cm^2), shall be determined in accordance with **Ch 2, 205**.	– typo – typo

Present	Correction	Reason
4. The web thickness t (mm), of a conventional frame shall be adopted not less than the greater of the following values. $t = \frac{k_s}{\sigma_y} pa + \Delta t$ (mm) or $t = 0.0114 d_w \sqrt{\sigma_y} + \Delta t$ (mm) Where k_s = ~~1.4~~ $\frac{Z}{Z_f}$, but not less than k_s = 1.0 ~~Z_f~~ = actual ultimate section modulus(cm^3), of a conventional frame, to be determined in accordance with **208.** ~~Z~~, p, a = refer to **Par 1** d_w, $\triangle t$ = refer to **Par 2**	**4.** The web thickness t_f (mm), of a conventional frame shall be adopted not less than the greater of the following values. $t_f = \frac{k_s}{\sigma_y} pa + \Delta t$ (mm) or $t_f = 0.0114 d_w \sqrt{\sigma_y} + \Delta t$ (mm) Where k_s = $1.4\frac{Z_f}{Z_a}$, but not less than k_s = 1.0 Z_a = actual ultimate section modulus(cm^3), of a conventional frame, to be determined in accordance with **208.** Z_f, p, a = refer to **Par 1** d_w, $\triangle t$ = refer to **Par 2**	– typo – typo
5. The face plate breadth ~~b~~ (mm), of a conventional frame shall not be less than the greater one of the following values. ~~$b = 0.0145\sigma_y \frac{Z}{Z_f} \sqrt{t_f t_a} \left(\frac{d_w}{t_a} \right)$~~ (mm) or ~~$b = 2.5 t_f$~~ (mm) or ~~$b = 69.6 t_a \sqrt{\frac{d_w}{t_f} (\beta^2 - 0.0029)}$~~ (mm) where ~~$Z$~~, a = refer to **Par 1** ~~Z_f~~ = refer to **Par 4** t_a = actual web thickness of a conventional frame(mm) ~~t_f~~ = face plate ~~breadth~~(mm) of a conventional frame(for beams made of bulbs, ~~$t = 1.5 s_{af}$~~ shall be adopted)	**5.** The face plate breadth b_f (mm), of a conventional frame shall not be less than the greater one of the following values. $b_f = 0.0145\sigma_y \frac{Z_f}{Z_a} \sqrt{c_f t_a} \left(\frac{d_w}{t_a} - 0.98 \right)$ (mm) or $b_f = 2.5 t_f$ (mm) or $b_f = 69.6 t_a \sqrt{\frac{d_w}{c_f} (\beta^2 - 0.0029)}$ (mm) where Z_f, a = refer to **Par 1** Z_a = refer to **Par 4** t_a = actual web thickness of a conventional frame(mm) c_f = face plate thickness(mm) of a conventional frame(for beams made of bulbs, $c_f = 1.5 t_a$ shall be adopted)	– typo – typo

Present	Correction	Reason
d_w = refer to **Par 2** ~~$\beta = \frac{(2-\alpha)l_S}{\alpha d_f}$~~, but not less than β = 0.055 l_S = the greatest spacing(m), of adjacent stringers crossing the frame span or the greatest distance(m) between the stringer and the supporting section $\alpha = \left(\frac{t_a}{t_{as}}\right)^2 + 0.01\frac{d_w t_{as}}{a t_a}$, but not less than α = 1 t_{as} = actual shell plating thickness(mm)	d_w = refer to **Par 2** $\beta = \frac{(2-\alpha)l_S}{\alpha d_w}$, but not less than β = 0.055 l_S = the greatest spacing(m), of adjacent stringers crossing the frame span or the greatest distance(m) between the stringer and the supporting section $\alpha = \left(\frac{t_a}{t_{as}}\right)^2 + 0.01\frac{d_w t_{as}}{a t_a}$, but not less than α = 1 t_{as} = actual shell plating thickness(mm)	- typo
6. Where the face plate breadth is not in accordance with **Par 5**, the height of a conventional frame shall not be less than determined by the formula. A distance between side stringers or a side stringer and a supporting structure for conventional frames shall not exceed 1.3 m.	**6.** Where the face plate breadth is not in accordance with **Par 5**, the height of a conventional frame shall not be less than determined by the formula. A distance between side stringers or a side stringer and a supporting structure for conventional frames shall not exceed 1.3 m.	
~~$d = 23.4(t_a - \Delta t)/\sqrt{\sigma_y}$~~ (cm) where t_a = refer to **Par 5** $\triangle t$ = refer to **Par 2**	$d_w = 23.4(t_a - \Delta t)/\sqrt{\sigma_y}$ (cm) where t_a = refer to **Par 5** $\triangle t$ = refer to **Par 2**	- typo

Present	Correction	Reason
210. Side and intercostal stringers as part of transverse framing with deep frames	**210. Side and intercostal stringers as part of transverse framing with deep frames**	
1. The ultimate section modulus ~~Z~~(cm^3) of a bearing side stringer shall not be less than determined by the formula.	**1.** The ultimate section modulus Z_s(cm^3) of a bearing side stringer shall not be less than determined by the formula.	– typo
~~$Z = 0.63 \cdot Z_0$~~ (cm^3)	$Z_s = 0.63 \cdot Z_{s0}$ (cm^3)	
where	where	
~~$Z_{s0} = 1.15 \frac{125}{\sigma_y}$~~ ~~$kp_s$~~ $p a_1^2 b Q$ (cm^3)	$Z_{s0} = 1.15 \frac{125}{\sigma_y}$ k_s^p $p a_1^2 b Q$ (cm^3)	
p, b = refer to **209. 1.**	p, b = refer to **209. 1.**	
a_1 = deep frame spacing(m) as measured along the side	a_1 = deep frame spacing(m) as measured along the side	
~~$kp_s = 0.82 - 0.55 a_1/lp \geq 0.6$ with $lp \geq a_1$~~	$k_s^p = 0.82 - 0.55 a_1/l^p \geq 0.6$ with $l^p \geq a_1$	– typo
~~$kp_s = 0.82 lp/a_1 - 0.55 \geq 0.6 lp/a_1$ with $lp < a_1$~~	$k_s^p = 0.82 l^p/a_1 - 0.55 \geq 0.6 l^p/a_1$ with $l^p < a_1$	
~~lp~~ = refer to **206. 5.**	l^p = refer to **206. 5.**	
$Q = 0.32 + 0.132 \frac{b}{l}$ with $m = 1$	$Q = 0.32 + 0.132 \frac{b}{l}$ with $m = 1$	
$Q = 0.358 + 0.11 \frac{b}{l}$ with $m \geq 2$	$Q = 0.358 + 0.11 \frac{b}{l}$ with $m \geq 2$	
m = number of side stringers in a grillage	m = number of side stringers in a grillage	
l = refer to **209. 1.**	l = refer to **209. 1.**	
2. The web area ~~A~~ (cm^2), of a side stringer shall not be less than determined by the formula.	**2.** The web area A_s (cm^2), of a side stringer shall not be less than determined by the formula.	– typo
~~$A = \frac{8.7 kp_s p a b}{\sigma_y} Qn + 0.1 d_s \Delta t$~~ (cm^2)	$A_s = \frac{8.7 k_s^p p a b}{\sigma_y} Qn + 0.1 d_s \Delta t$ (cm^2)	

Present	Correction	Reason
where p, a, b = refer to **209. 1.** n = number of frames fitted between considered side stringers ~~kp_s~~, Q = refer to **Par 1** d_s = web height of a side stringer(cm) Δs = refer to **209. 2.**	where p, a, b = refer to **209. 1.** n = number of frames fitted between considered side stringers k_s^p, Q = refer to **Par 1** d_s = web height of a side stringer(cm) Δs = refer to **209. 2.**	– typo
3. The actual web area A (cm^2), of a side stringer shall be determined in accordance with **Ch 2, 205**.	**3.** The actual web area A (cm^2), of a side stringer shall be determined in accordance with **Ch 2, 205**.	
4. The web thickness ~~t~~ (mm), of a side stringer shall not be less than determined by the formula ~~$t = 2.63 c_1 \sqrt{\frac{\gamma_c \sigma_y}{5.34 + 4\left(\frac{c_1}{c_2}\right)^2}} + \Delta t$~~ (mm) where c_1, c_2 = the shorter and longer side, in m, of the panels into which the stringer web is divided by its stiffeners for an unstiffened web, $c_1 = 0.01(d_s - 0.8 d_f)$, $c_2 = a_1$ d_s = refer to **Par 2** d_w = refer to **209. 2.** a_1 = refer to **Par 1** ~~$\gamma_s = \frac{A_s}{A_a}$~~ A_s, ~~A_a~~ = **Par 2, 3** Δt = refer to **209. 2.**	**4.** The web thickness t_s (mm), of a side stringer shall not be less than determined by the formula $t_s = 2.63 c_1 \sqrt{\frac{\gamma_s \sigma_y}{5.34 + 4\left(\frac{c_1}{c_2}\right)^2}} + \Delta t$ (mm) where c_1, c_2 = the shorter and longer side, in m, of the panels into which the stringer web is divided by its stiffeners for an unstiffened web, $c_1 = 0.01(d_s - 0.8 d_f)$, $c_2 = a_1$ d_s = refer to **Par 2** d_w = refer to **209. 2.** a_1 = refer to **Par 1** $\gamma_s = \frac{A_s}{A}$ A_s, A = **Par 2, 3** Δt = refer to **209. 2.**	– typo
5. The web height ~~d~~ (cm), of a side stringer shall not be less than determined by the formula ~~$d = 2 d_w$~~ (cm)	**5.** The web height d_s (cm), of a side stringer shall not be less than determined by the formula $d_s = 2 d_w$ (cm)	– typo

Present	Correction	Reason
where d_w = refer to **209. 2.**	where d_w = refer to **209. 2.**	
6. The face plate thickness of a side stringer shall not be less than its actual web thickness. The side stringer without face plate is not permitted.	**6.** The face plate thickness of a side stringer shall not be less than its actual web thickness. The side stringer without face plate is not permitted.	
7. The face plate breadth ~~b~~ (mm), of a side stringer shall not be less than the greater of the following values ~~$b = 0.0165\sigma_y \frac{Z}{Z_a}\sqrt{t_s t_{as}}\left(\frac{d_s}{t_{as}} - 2.6\right)$~~ (mm) or ~~$b = 7.5 t_s$~~ (mm) where ~~$Z$~~ = refer to **Par 1** Z_a = actual ultimate section modulus (cm^3) of aside stringer, to be determined in accordance with **Ch 2, 205**. ~~t_s~~ = face plate thickness (mm) of a stringer t_{as} = actual web thickness of a stringer d_s = refer to **Par 2**	**7.** The face plate breadth b_s (mm), of a side stringer shall not be less than the greater of the following values $b_s = 0.0165\sigma_y \frac{Z_s}{Z_a}\sqrt{c_s t_{as}}\left(\frac{d_s}{t_{as}} - 2.6\right)$ (mm) or $b_s = 7.5 t_s$ (mm) where Z_s = refer to **Par 1** Z_a = actual ultimate section modulus (cm^3) of aside stringer, to be determined in accordance with **Ch 2, 205**. c_s = face plate thickness (mm) of a stringer t_{as} = actual web thickness of a stringer d_s = refer to **Par 2**	– typo
8. The web height ~~d~~ (cm), of an intercostal stringer in way of a conventional frame shall not be less than determined by the formula ~~$d = 0.8 d_w$~~ (cm) where d_w = refer to **209. 2.**	**8.** The web height d_i (cm), of an intercostal stringer in way of a conventional frame shall not be less than determined by the formula $d_i = 0.8 d_w$ (cm) where d_w = refer to **209. 2.**	– typo
9. The web thickness of an intercostal stringer shall not be less than that of a conventional frame, as required in accordance with **209. 4.**	**9.** The web thickness of an intercostal stringer shall not be less than that of a conventional frame, as required in accordance with **209. 4.**	

Present	Correction	Reason
211. Deep frames as part of transverse framing **1.** The ultimate section modulus ~~Z~~ (cm^3) of a deep frame shall not be less than determined by the formula. ~~$Z = 0.63 \cdot Z_0$~~ (cm^3) where ~~$Z_0 = 1.15 \frac{250}{\sigma_y} k p_{wf} p a b l_{wf} (1 - \frac{0.5b}{l_{wf}} + k_m G)$~~ k_m = refer to **Table 3.31** $G = nQ_m$ n = number of frames fitted between considered deep frames $Q_m = Q$ with $m = 1, 2$ $Q_m = C_{m1} + C_{m2}(0.5 \frac{b}{l}(\psi_f - 0.5) - \psi_f)$ with $m = 3, 4, 5, 6$ C_{m1}, C_{m2} = factors to be determined from **Table 3.32** Q = refer to **210. 1.** ψ_f = factor to be adopted equal to the lesser of the following ~~$\psi_f = \frac{Z_{af}}{Z_{f0}}$~~ or $\psi_f = 1.4 k_f^2$ Z_{f0}, k_f = refer to **209. 1.** ~~Z_{af}~~ = refer to **209. 4.** $k_{wf}^k = 0.82(1 - a_1/l^p) \geq 0.6$ with $l^p \geq 2a_1$ $k_{wf}^p = 0.41(l^p/a_1 - 1) \geq 0.3 l^p/a_1$ with $l^p < 2a_1$ l_P = refer to **206. 5.** a_1 = refer to **210. 1.** p, a, b = refer to **209. 1.** l_{wf} = span~~(mm)~~ between supporting section of a deep frames	**211. Deep frames as part of transverse framing** **1.** The ultimate section modulus Z_{wf} (cm^3) of a deep frame shall not be less than determined by the formula. $Z_{wf} = 0.63 \cdot Z_{wf0}$ (cm^3) where $Z_{wf0} = 1.15 \frac{250}{\sigma_y} k_{wf}^p p a b l_{wf} (1 - \frac{0.5b}{l_{wf}} + k_m G)$ k_m = refer to **Table 3.31** $G = nQ_m$ n = number of frames fitted between considered deep frames $Q_m = Q$ with $m = 1, 2$ $Q_m = C_{m1} + C_{m2}(0.5 \frac{b}{l}(\psi_f - 0.5) - \psi_f)$ with $m = 3, 4, 5, 6$ C_{m1}, C_{m2} = factors to be determined from **Table 3.32** Q = refer to **210. 1.** ψ_f = factor to be adopted equal to the lesser of the following $\psi_f = \frac{Z_a}{Z_{f0}}$ or $\psi_f = 1.4 k_f^2$ Z_{f0}, k_f = refer to **209. 1.** Z_a = refer to **209. 4.** $k_{wf}^k = 0.82(1 - a_1/l^p) \geq 0.6$ with $l^p \geq 2a_1$ $k_{wf}^p = 0.41(l^p/a_1 - 1) \geq 0.3 l^p/a_1$ with $l^p < 2a_1$ l_P = refer to **206. 5.** a_1 = refer to **210. 1.** p, a, b = refer to **209. 1.** l_{wf} = span(m) between supporting section of a deep frames	– typo – typo

Present	Correction	Reason
2. The web area A_{wf} (cm^2) of a deep frame shall not be less than determined by the formula. ~~$A = \frac{8.7pabkp_{wf}}{\sigma_y}(i+m/G)+0.1d_{wf}\Delta t$~~ (cm^2) where p, a, b = refer to **209. 1.** ~~kp_{wf}~~, G = refer to **Par 1** m = refer to **210. 1.** d_{wf} = deep frame web depth (cm) $\triangle t$ = refer to **209. 2.** **3.** The actual web area A (cm^2) of a deep frame shall be determined in accordance with **Ch 2, 205.** **4.** The web thickness ~~t~~ (mm) shall be adopted not less than the greater of the following values. ~~$t = \frac{k_s}{\sigma_y}pa+\Delta t$~~ (mm) or ~~$t = 2.63c_1\frac{\sqrt{\gamma_{wf}\sigma_y}}{5.34+4(\frac{c_1}{c_2})^2}+\Delta t$~~ (mm) where ~~$k_s = \frac{1}{1.25\frac{Z_a}{Z}-0.75}$~~, but not less than $k_s = 1.0$ Z_a = actual ultimate section modulus (cm^3) of a deep frame to be determined in accordance with **Ch 2, 205.**	**2.** The web area A_{wf} (cm^2) of a deep frame shall not be less than determined by the formula. $A_{wf} = \frac{8.7pabk^p_{wf}}{\sigma_y}(i+m \cdot G)+0.1d_{wf}\Delta t$ (cm^2) where p, a, b = refer to **209. 1.** k^p_{wf}, G = refer to **Par 1** m = refer to **210. 1.** d_{wf} = deep frame web depth (cm) $\triangle t$ = refer to **209. 2.** **3.** The actual web area A (cm^2) of a deep frame shall be determined in accordance with **Ch 2, 205.** **4.** The web thickness t_{wf} (mm) shall be adopted not less than the greater of the following values. $t_{wf} = \frac{k_s}{\sigma_y}pa+\Delta t$ (mm) or $t = 2.63c_1\sqrt{\frac{\gamma_{wf}\sigma_y}{5.34+4(\frac{c_1}{c_2})^2}}+\Delta t$ (mm) where $k_s = \frac{1}{1.25\frac{Z_a}{Z_{wf}}-0.75}$, but not less than $k_s = 1.0$ Z_a = actual ultimate section modulus (cm^3) of a deep frame to be determined in accordance with **Ch 2, 205.**	– typo – typo

Present	Correction	Reason
p, a = refer to **206. 3. (1)** ~~Z~~ = refer to **Par 1** ~~$\gamma_{wf} = \frac{A_{wf}}{A_f}$~~ A_{wf} = refer to **Par 2** ~~A_f~~ = refer to **Par 3** c_1, c_2 = the shorter and the longer side(m) of panels into which the web of a deep frame is divided by its stiffeners Δt = refer to **209. 2**	p, a = refer to **206. 3. (1)** Z_{wf} = refer to **Par 1** $\gamma_{wf} = \frac{A_{wf}}{A}$ A_{wf} = refer to **Par 2** A = refer to **Par 3** c_1, c_2 = the shorter and the longer side(m) of panels into which the web of a deep frame is divided by its stiffeners Δt = refer to **209. 2.**	– typo
5. 〈omission〉	**5. 〈same as present〉**	
6. The face plate breadth ~~b~~ (mm) of a deep frame shall not be less than the greater of the following values. ~~$b = A_1 \sigma_y \frac{Z}{Z_a} \sqrt{t_{wf} t_{awf}} \left(\frac{d_{wf}}{t_{awf}} - A_2\right)$~~ (mm) or ~~$b = A_3 t_{wf}$~~ (mm) where ~~$Z$~~ = refer to **Par 1** Z_a refer to **Par 4** t_{wf} = face plate thickness(mm) of a deep frame t_{awf} = web thickness(mm) of a deep frame d_{wf} = refer to **Par 2** A_1, A_2, A_3 = refer to **Table 3.33**	**6.** The face plate breadth b_{wf} (mm) of a deep frame shall not be less than the greater of the following values. $b_{wf} = A_1 \sigma_y \frac{Z_{wf}}{Z_a} \sqrt{t_{wf} t_{awf}} \left(\frac{d_{wf}}{t_{awf}} - A_2\right)$ (mm) or $b_{wf} = A_3 t_{wf}$ (mm) where Z_{wf} = refer to **Par 1** Z_a refer to **Par 4** t_{wf} = face plate thickness(mm) of a deep frame t_{awf} = web thickness(mm) of a deep frame d_{wf} = refer to **Par 2** A_1, A_2, A_3 = refer to **Table 3.33**	– typo

Present	Correction	Reason
212. Side and bottom longitudinals as part of longitudinal framing **1.** The ultimate section modulus ~~Z~~ (cm^3) of a longitudinal shall not be less than determined by the formula. ~~$Z = 0.63 \cdot Z_0$~~ (cm^3) where ~~$Z_0 = 1.15 \frac{125}{\sigma_y} p b_1 l (l - 0.5a) c^2$~~ (cm^3) p, b = refer to **209. 1.** l = spacing(m) of deep frames or floors $b_1 = k_0 b_2$ ~~$k_0 = 1 - \frac{0.3}{b}$~~ $b_2 = b(1 - 0.25\frac{b}{a})$ with $\frac{b}{a} < 2$ $b_2 = a$ with $\frac{b}{a} \geq 2$ a = spacing(m) of longitudinals c = 1, for bottom longitudinals and for side longitudinals where no panting frames are fitted $c = \frac{1}{1 + \frac{0.25}{e}}$, for side longitudinals where panting frames are fitted $e = \frac{b}{a} + 1$	**212. Side and bottom longitudinals as part of longitudinal framing** **1.** The ultimate section modulus Z_l (cm^3) of a longitudinal shall not be less than determined by the formula. $Z_l = 0.63 \cdot Z_{l0}$ (cm^3) where $Z_{l0} = 1.15 \frac{125}{\sigma_y} p b_1 l (l - 0.5a) c^2$ (cm^3) p, b = refer to **209. 1.** l = spacing(m) of deep frames or floors $b_1 = k_0 b_2$ $k_0 = 1 - \frac{0.3}{(\frac{b}{a})}$ $b_2 = b(1 - 0.25\frac{b}{a})$ with $\frac{b}{a} < 2$ $b_2 = a$ with $\frac{b}{a} \geq 2$ a = spacing(m) of longitudinals c = 1, for bottom longitudinals and for side longitudinals where no panting frames are fitted $c = \frac{1}{1 + \frac{0.25}{e}}$, for side longitudinals where panting frames are fitted $e = \frac{b}{a} + 1$	– typo

Present	Correction	Reason
2. The web area A (cm^2) of a longitudinal shall not be less than determined by the formula. ~~$A = \frac{8.7}{\sigma_y} p_1 b_1 l c k_1 + 0.1 d_l \Delta t$~~ (cm^2) where p = refer to **209. 1.** b_1, l, c = refer to **Par 1** k_1 = factor to be adopted as the greater of the following $k_1 = \frac{1}{1+0.76\frac{a_0}{l}}$, or $k_1 = 0.8$ d_l = web height (cm) of a longitudinal $\triangle t$ = refer to **209. 2.**	**2.** The web area A_l(cm^2) of a longitudinal shall not be less than determined by the formula. $A_l = \frac{8.7}{\sigma_y} p b_1 l c k_1 + 0.1 d_l \Delta t$ (cm^2) where p = refer to **209. 1.** b_1, l, c = refer to **Par 1** k_1 = factor to be adopted as the greater of the following $k_1 = \frac{1}{1+0.76\frac{a_0}{l}}$, or $k_1 = 0.8$ d_l = web height (cm) of a longitudinal $\triangle t$ = refer to **209. 2.**	– typo
3. **〈omission〉**	**3.** **〈omission〉**	
4. The web area ~~t~~(mm) of a longitudinal shall be adopted not less than the greater one of the following values. ~~$t = \frac{k_s}{\sigma_y} p b_1 + \Delta t$~~ (mm) or ~~$t = 0.013 d_l \sqrt{\sigma_y} + \Delta t$~~ (mm) where $k_s = 1.4\,$~~Z/Z_a~~, but not less than $k_s = 1.0$ ~~Z~~ = refer to **Par 1** Z_a = actual ultimate section modulus (cm^3) of a longitudinal, to be determined in accordance with **Ch 2, 205.** p = refer to **209. 1.** b_1 = refer to **Par 1** d_l = refer to **Par 2** $\triangle t$ = refer to **209. 2.**	**4.** The web area t_l(mm) of a longitudinal shall be adopted not less than the greater one of the following values. $t_l = \frac{k_s}{\sigma_y} p b_1 + \Delta t$ (mm) or $t_l = 0.013 d_l \sqrt{\sigma_y} + \Delta t$ (mm) where $k_s = 1.4\, Z_l / Z_a$, but not less than $k_s = 1.0$ Z_l = refer to **Par 1** Z_a = actual ultimate section modulus (cm^3) of a longitudinal, to be determined in accordance with **Ch 2, 205.** p = refer to **209. 1.** b_1 = refer to **Par 1** d_l = refer to **Par 2** $\triangle t$ = refer to **209. 2.**	– typo

Present	Correction	Reason
5. The face plate breadth ~~b~~ (mm) of a longitudinal shall not be less than the greater of the following values. ~~$b = 0.0145\sigma_y \frac{Z}{Z_a}\sqrt{t_l t_{al}}\left(\frac{d_l}{t_{al}} - 0.98\right)$~~ (mm) or ~~$b = 2.5t_l$~~ (mm) or ~~$b = 69.6t_{al}\sqrt{\frac{d_l}{t_l}(\beta^2 - 0.0029)}$~~ (mm) where ~~$Z$~~ = refer to **Par 1** Z_a = refer to **Par 4** t_{al} = actual web thickness(mm) of a longitudinal ~~$t_l =$~~ face plate thickness(mm) of a longitudinal(for longitudinals of bulb, ~~$t_l = 1.5s_{al}$~~ shall be adopted) d_l = refer to **Par 2** $\beta = \frac{(2-\alpha)l_s}{\alpha h_l}$, but not less than $\beta = 0.055$ $\alpha = (\frac{s_{al}}{s_{as}})^2 + \frac{0.01h_l s_{as}}{as_{al}}$, but not less than $\alpha = 1$ t_{as} = actual shell plating thickness(mm) a = refer to **Par 1** l_s = span(m) of a longitudinal **6.** **〈omission〉**	**5.** The face plate breadth b_l (mm) of a longitudinal shall not be less than the greater of the following values. $b_l = 0.0145\sigma_y \frac{Z_l}{Z_a}\sqrt{c_l t_{al}}\left(\frac{d_l}{t_{al}} - 0.98\right)$ (mm) or $b_l = 2.5t_l$ (mm) or $b_l = 69.6t_{al}\sqrt{\frac{d_l}{c_l}(\beta^2 - 0.0029)}$ (mm) where Z_l = refer to **Par 1** Z_a = refer to **Par 4** t_{al} = actual web thickness(mm) of a longitudinal $c_l =$ face plate thickness(mm) of a longitudinal(for longitudinals of bulb, $c_l = 1.5t_{al}$ shall be adopted) d_l = refer to **Par 2** $\beta = \frac{(2-\alpha)l_s}{\alpha h_l}$, but not less than $\beta = 0.055$ $\alpha = (\frac{s_{al}}{s_{as}})^2 + \frac{0.01h_l s_{as}}{as_{al}}$, but not less than $\alpha = 1$ t_{as} = actual shell plating thickness(mm) a = refer to **Par 1** l_s = span(m) of a longitudinal **6.** **〈omission〉**	– typo

Present	Correction	Reason
213. Deep frames as part of longitudinal framing	**213. Deep frames as part of longitudinal framing**	
1. The ultimate section modulus Z (cm^3) of a deep frame shall not be less than determined by the formula.	**1.** The ultimate section modulus Z_{wfl}(cm^3) of a deep frame shall not be less than determined by the formula.	– typo
~~$Z = 0.63 \cdot Z_0$~~ (cm^3)	$Z_{wfl} = 0.63 \cdot Z_{wfl0}$ (cm^3)	
where	where	
~~$Z_0 = 1.15 \frac{500}{\sigma_y} pabkp_w l(1+k_g)(Q - \frac{k_g 0.33\beta}{e})$~~	$Z_{wfl0} = 1.15 \frac{500}{\sigma_y} pabk_w^p l(1+k_g)(Q - \frac{k_g 0.33\beta}{e})$	
p, b = refer to **209. 1.**	p, b = refer to **209. 1.**	
kp_w = refer to **211. 1.**	kp_w = refer to **211. 1.**	
a, l, e = refer to **212. 1.**	a, l, e = refer to **212. 1.**	
$Q = 2 - 1.1\beta$	$Q = 2 - 1.1\beta$	
$\beta = \frac{b_1 e}{b}$	$\beta = \frac{b_1 e}{b}$	
b_1 = refer to **212. 1.**	b_1 = refer to **212. 1.**	
k_g = factor to be adopted as the lesser of the following	k_g = factor to be adopted as the lesser of the following	
~~$k_g = 0.5(\frac{eQ}{R} - 1)$~~ or	$k_g = 0.5(\frac{eQ}{0.33} - 1)$ or	
$k_g = 0.5(k - 0.25(e+1))$	$k_g = 0.5(k - 0.25(e+1))$	
k = number of longitudinals in considered transverse span	k = number of longitudinals in considered transverse span	
2. The web area ~~A~~ (cm^2) of a deep frame shall not be less than determined by the formula.	**2.** The web area A_{wfl} (cm^2) of a deep frame shall not be less than determined by the formula.	– typo
~~$A = \frac{8.7}{\sigma_y} pbkp_w l Q + 0.1 d_{wf} \Delta t$~~ (cm^2)	$A_{wfl} = \frac{8.7}{\sigma_y} pbk_{wf}^p l Q + 0.1 d_{wfl} \Delta t$ (cm^2)	

Present	Correction	Reason
where p, b = refer to **209. 1.** l = refer to **212. 1.** Q = refer to **Par 1** ~~d_{wf}~~ = transverse web height(cm) $\triangle t$ = refer to **209. 2.**	where p, b = refer to **209. 1.** l = refer to **212. 1.** Q = refer to **Par 1** d_{wfl} = transverse web height(cm) $\triangle t$ = refer to **209. 2.**	– typo
3. The actual web area A (cm^2) of a deep frame shall be determined in accordance with **Ch 2, 205**.	**3.** The actual web area A (cm^2) of a deep frame shall be determined in accordance with **Ch 2, 205**.	
4. The web thickness of a deep frame shall not be less than the greater of the values determined by **211. 4**, while ~~Z~~ is required ultimate section modulus(cm^3) of a transverse shall be in accordance with **Par 1** and a is spacing(m) of longitudinals. The requirements of this paragraph apply to the vertical diaphragms of the double side.	**4.** The web thickness of a deep frame shall not be less than the greater of the values determined by **211. 4**, while Z_{wfl} is required ultimate section modulus(cm^3) of a transverse shall be in accordance with **Par 1** and a is spacing(m) of longitudinals. The requirements of this paragraph apply to the vertical diaphragms of the double side.	– typo
5. The web height of a deep frame shall not be less than determined by the formula. ~~$d = 2d_l$~~ (cm) where d_l = web height (cm) of a longitudinal	**5.** The web height of a deep frame shall not be less than determined by the formula. $d_{wfl} = 2d_l$ (cm) where d_l = web height (cm) of a longitudinal	
6. The face plate thickness of a transverse shall not be less than its actual web thickness.	**6.** The face plate thickness of a transverse shall not be less than its actual web thickness.	
7. The face plate breadth of a transverse shall be determined in accordance with **211. 6.** while ~~Z_{wf}~~ shall be in accordance with **Par 1**. The transverse without face plate (flat bar) is not permitted. ⚓	**7.** The face plate breadth of a transverse shall be determined in accordance with **211. 6.** while Z_{wfl} shall be in accordance with **Par 1**. The transverse without face plate (flat bar) is not permitted. ⚓	– typo