

Corrigenda for 2025 Classification Technical Rules



2025

* Please note that this corrigenda is for the printed version of the 2025 Classification Technical Rules, and the PDF files posted on the website have been corrected.

Notation Guide

Present	Amendment	Note																
<p style="text-align: center;"><Notation Guide></p> <p style="text-align: center;">Ch3 ADDITIONAL SPECIAL FEATURE NOTATIONS</p> <table border="1" data-bbox="129 432 990 879"> <thead> <tr> <th data-bbox="129 432 342 504">Additional Special Feature Notations</th> <th data-bbox="342 432 990 504">Relevant Requirements</th> </tr> </thead> <tbody> <tr> <td data-bbox="129 504 342 600">Reduced Freeboard (2023)</td> <td data-bbox="342 504 990 600">to ships comply with the requirement specified in Annex 1 of the Rules for the Classification of Dredgers</td> </tr> <tr> <td data-bbox="129 600 342 695">ETA (2025)</td> <td data-bbox="342 600 990 695">to ships where the Emergency Towing Arrangement specified in Pt 4, Ch10, 101. 4. (3) of the Rules is applied.</td> </tr> <tr> <td data-bbox="129 695 342 879">LSN (2025)</td> <td data-bbox="342 695 990 879">to be assigned to ships where the program for lashing calculations is approved by the Society in accordance with the requirements in Ch 4, Sec 4 of the Guidance for Approval of Manufacturing Process and Type Approval, ETC (Lashing Software for Nonstandardized cargo)</td> </tr> </tbody> </table>	Additional Special Feature Notations	Relevant Requirements	Reduced Freeboard (2023)	to ships comply with the requirement specified in Annex 1 of the Rules for the Classification of Dredgers	ETA (2025)	to ships where the Emergency Towing Arrangement specified in Pt 4, Ch10, 101. 4. (3) of the Rules is applied.	LSN (2025)	to be assigned to ships where the program for lashing calculations is approved by the Society in accordance with the requirements in Ch 4, Sec 4 of the Guidance for Approval of Manufacturing Process and Type Approval, ETC (Lashing Software for Nonstandardized cargo)	<p style="text-align: center;"><Notation Guide></p> <p style="text-align: center;">Ch3 ADDITIONAL SPECIAL FEATURE NOTATIONS</p> <table border="1" data-bbox="1034 432 1895 879"> <thead> <tr> <th data-bbox="1034 432 1247 504">Additional Special Feature Notations</th> <th data-bbox="1247 432 1895 504">Relevant Requirements</th> </tr> </thead> <tbody> <tr> <td data-bbox="1034 504 1247 600">Reduced Freeboard (2023)</td> <td data-bbox="1247 504 1895 600">to ships comply with the requirement specified in Annex 1 of the Rules for the Classification of Dredgers</td> </tr> <tr> <td data-bbox="1034 600 1247 695">ETA (2025)</td> <td data-bbox="1247 600 1895 695">to ships where the Emergency Towing Arrangement specified in Pt 4, Ch8, 205. of the Rules is applied.</td> </tr> <tr> <td data-bbox="1034 695 1247 879">LSN (2025)</td> <td data-bbox="1247 695 1895 879">to be assigned to ships where the program for lashing calculations is approved by the Society in accordance with the requirements in Ch 4, Sec 4 of the Guidance for Approval of Manufacturing Process and Type Approval, ETC (Lashing Software for Nonstandardized cargo)</td> </tr> </tbody> </table>	Additional Special Feature Notations	Relevant Requirements	Reduced Freeboard (2023)	to ships comply with the requirement specified in Annex 1 of the Rules for the Classification of Dredgers	ETA (2025)	to ships where the Emergency Towing Arrangement specified in Pt 4, Ch8, 205. of the Rules is applied.	LSN (2025)	to be assigned to ships where the program for lashing calculations is approved by the Society in accordance with the requirements in Ch 4, Sec 4 of the Guidance for Approval of Manufacturing Process and Type Approval, ETC (Lashing Software for Nonstandardized cargo)	<p style="text-align: center;">- reference error</p>
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Present

Reason

[<Notation Guide>](#)

CHAPTER 3 ADDITIONAL SPECIAL FEATURE NOTATIONS

Additional Special Feature Notations	Relevant Requirements
(LC), (LC-G), (HSLC - SA0, SA1, SA2, SA3, SA4, SA5) <i>(2018)</i>	LC : to Light Craft as specified in <u>Pt 1, Ch 1, 103. (1)</u> of the Rules for the Classification of High Speed and Light Crafts. (Light Craft)
	LC-G : to Light Craft as specified in Annex 1 and Annex 2 of the Guidance Relating to the Rules for the Classification of High Speed and Light Crafts, 1998 edition.
	HSLC : to High Speed and Light Craft as specified in <u>Pt 1, Ch 1, 103. (2)</u> of the Rules for the Classification of High Speed and Light Crafts. (High Speed Light Craft)
	SA0, SA1, SA2, SA3, SA4, SA5 : The service restriction notation specified in <u>Pt 3, Ch 1, 121.</u> of the Rules for the Classification of High Speed and Light Crafts. (Service Area restriction)

- Typo
: Citation errors



Correction

Reason

CHAPTER 3 ADDITIONAL SPECIAL FEATURE NOTATIONS

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	HSLC : to High Speed and Light Craft as specified in Pt 1, Ch 1, 103. (2) Ch 1, 101. 3 (2) of the Rules for the Classification of High Speed and Light Crafts. (High Speed Light Craft)
	SA0, SA1, SA2, SA3, SA4, SA5 : The service restriction notation specified in Pt 3, Ch 1, 121. Ch 3, 101. 21 of the Rules for the Classification of High Speed and Light Crafts. (Service Area restriction)

– Typo
: Citation errors



Present	Amendment	Note															
<p style="text-align: center;">〈Notation Guide〉</p> <p style="text-align: center;">CHAPTER 2 Ship Type Notations and Special Feature Notations</p> <p>26. Offshore Support Vessel</p> <p>NOTATIONS (Ship Type Notations)</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px 0;"> Offshore Support Vessel </div> <p>DESCRIPTIONS</p> <p>Offshore Support Vessel : to be assigned to self-propelled offshore support vessels whose regular trade is to provide services in support of exploration, exploitation, or production of offshore energy or alternative energy resources. These services may include but are not limited to transportation of supplies and equipment, towing and anchoring of offshore structures, fire fighting, handling heavy surface and subsea loads, oil spill recovery and wind turbine installation.</p> <p>REQUIREMENTS / RULE REFERENCES</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Notations</th> <th style="width: 33%;">Design</th> <th style="width: 33%;">Survey</th> </tr> </thead> <tbody> <tr> <td>Offshore Support Vessel</td> <td>Guidance for OSV (Offshore Support Vessels)</td> <td>Guidance for OSV (Offshore Support Vessels)</td> </tr> </tbody> </table>	Notations	Design	Survey	Offshore Support Vessel	Guidance for OSV (Offshore Support Vessels)	Guidance for OSV (Offshore Support Vessels)	<p style="text-align: center;">〈Notation Guide〉</p> <p style="text-align: center;">CHAPTER 2 Ship Type Notations and Special Feature Notations</p> <p>26. Offshore Support Vessel</p> <p>NOTATIONS (Ship Type Notations)</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px 0;"> Offshore Support Vessel </div> <p>DESCRIPTIONS</p> <p>Offshore Support Vessel : to be assigned to self-propelled offshore support vessels whose regular trade is to provide services in support of exploration, exploitation, or production of offshore energy or alternative energy resources. These services may include but are not limited to transportation of supplies and equipment, towing and anchoring of offshore structures, fire fighting, handling heavy surface and subsea loads, oil spill recovery and wind turbine installation.</p> <p>REQUIREMENTS / RULE REFERENCES</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Notations</th> <th style="width: 33%;">Design</th> <th style="width: 33%;">Survey</th> </tr> </thead> <tbody> <tr> <td>Offshore Support Vessel</td> <td>Guidance for OSV (Offshore Support Vessels)¹⁾</td> <td>Guidance for OSV (Offshore Support Vessels)¹⁾</td> </tr> <tr> <td colspan="3" style="text-align: center; color: red;"> ¹⁾ For high speed and/or light crafts, the Rules for the Classification of High Speed and Light Craft are to be applied. </td> </tr> </tbody> </table>	Notations	Design	Survey	Offshore Support Vessel	Guidance for OSV (Offshore Support Vessels) ¹⁾	Guidance for OSV (Offshore Support Vessels) ¹⁾	¹⁾ For high speed and/or light crafts, the Rules for the Classification of High Speed and Light Craft are to be applied.			<p>-Provide additional clarification</p>
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PART 1

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<p style="text-align: center;">〈Guidance〉 – Pt 1</p> <p style="text-align: center;">Annex 1–1 Class Notations</p> <p>1. Class Notations</p> <p>1.1 Ship Type and Special Feature Notations</p> <table border="1" data-bbox="129 523 985 970"> <thead> <tr> <th data-bbox="129 523 342 598">Additional Special Feature Notations</th> <th data-bbox="342 523 985 598">Relevant Requirements</th> </tr> </thead> <tbody> <tr> <td data-bbox="129 598 342 694">Reduced Freeboard (2023)</td> <td data-bbox="342 598 985 694">to ships comply with the requirement specified in Annex 1 of the Rules for the Classification of Dredgers</td> </tr> <tr> <td data-bbox="129 694 342 790">ETA (2025)</td> <td data-bbox="342 694 985 790">to ships where the Emergency Towing Arrangement specified in Pt 4, Ch10, 101. 4. (3) of the Rules is applied.</td> </tr> <tr> <td data-bbox="129 790 342 970">LSN (2025)</td> <td data-bbox="342 790 985 970">to be assigned to ships where the program for lashing calculations is approved by the Society in accordance with the requirements in Ch 4, Sec 4 of the Guidance for Approval of Manufacturing Process and Type Approval, ETC (Lashing Software for Nonstandardized cargo)</td> </tr> </tbody> </table>	Additional Special Feature Notations	Relevant Requirements	Reduced Freeboard (2023)	to ships comply with the requirement specified in Annex 1 of the Rules for the Classification of Dredgers	ETA (2025)	to ships where the Emergency Towing Arrangement specified in Pt 4, Ch10, 101. 4. (3) of the Rules is applied.	LSN (2025)	to be assigned to ships where the program for lashing calculations is approved by the Society in accordance with the requirements in Ch 4, Sec 4 of the Guidance for Approval of Manufacturing Process and Type Approval, ETC (Lashing Software for Nonstandardized cargo)	<p style="text-align: center;">〈Guidance〉 – Pt 1</p> <p style="text-align: center;">Annex 1–1 Class Notations</p> <p>1. Class Notations</p> <p>1.1 Ship Type and Special Feature Notations</p> <table border="1" data-bbox="1034 523 1890 970"> <thead> <tr> <th data-bbox="1034 523 1247 598">Additional Special Feature Notations</th> <th data-bbox="1247 523 1890 598">Relevant Requirements</th> </tr> </thead> <tbody> <tr> <td data-bbox="1034 598 1247 694">Reduced Freeboard (2023)</td> <td data-bbox="1247 598 1890 694">to ships comply with the requirement specified in Annex 1 of the Rules for the Classification of Dredgers</td> </tr> <tr> <td data-bbox="1034 694 1247 790">ETA (2025)</td> <td data-bbox="1247 694 1890 790">to ships where the Emergency Towing Arrangement specified in Pt 4, Ch8, 205. of the Rules is applied.</td> </tr> <tr> <td data-bbox="1034 790 1247 970">LSN (2025)</td> <td data-bbox="1247 790 1890 970">to be assigned to ships where the program for lashing calculations is approved by the Society in accordance with the requirements in Ch 4, Sec 4 of the Guidance for Approval of Manufacturing Process and Type Approval, ETC (Lashing Software for Nonstandardized cargo)</td> </tr> </tbody> </table>	Additional Special Feature Notations	Relevant Requirements	Reduced Freeboard (2023)	to ships comply with the requirement specified in Annex 1 of the Rules for the Classification of Dredgers	ETA (2025)	to ships where the Emergency Towing Arrangement specified in Pt 4, Ch8, 205. of the Rules is applied.	LSN (2025)	to be assigned to ships where the program for lashing calculations is approved by the Society in accordance with the requirements in Ch 4, Sec 4 of the Guidance for Approval of Manufacturing Process and Type Approval, ETC (Lashing Software for Nonstandardized cargo)	<p style="text-align: center;">- reference error</p>
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Present	Amendment	Note
<p style="text-align: center;"><RULE> Part 1 CHAPTER 2 PERIODICAL AND OTHER SURVEYS</p> <p style="text-align: center;">Section 6 Docking Survey</p> <p>603. Requirements of survey</p> <ol style="list-style-type: none"> 1. <same> 2. <same> 3. <same> 4. Sea chests and their gratings, sea connections and overboard discharge valves and cocks and their fastenings to the hull or sea chests are to be examined. <u>Valves and cocks could be opened up more than once in a special survey period (5years) unless "considered necessary by the Surveyor". (2025)</u> 	<p style="text-align: center;"><RULE> Part 1 CHAPTER 2 PERIODICAL AND OTHER SURVEYS</p> <p style="text-align: center;">Section 6 Docking Survey</p> <p>603. Requirements of survey</p> <ol style="list-style-type: none"> 1. <same> 2. <same> 3. <same> 4. Sea chests and their gratings, sea connections and overboard discharge valves and cocks and their fastenings to the hull or sea chests are to be examined. Valves and cocks need not be opened up more than once in a special survey period (5years) unless "considered necessary by the Surveyor". (2025) 	<p>Corrected for consistency with UR Z3 and to avoid misinterpretation caused by the previous incorrect wording.</p> <p>(Z3.2.3) Sea chests and their gratings, sea connections and overboard discharge valves and cocks and their fastenings to the hull or sea chests are to be examined. Valves and cocks need not be opened up more than once in a special survey period unless considered necessary by the Surveyor.</p>

Present	Amendment	비 고
<p style="text-align: center;">〈RULE PART 1〉</p> <p style="text-align: center;">Section 3 Intermediate Survey</p> <p>303. Machinery, electrical installations and additional installations</p> <p>2. Internal combustion engines for main engines</p> <p>(1) Partial open-up survey for one cylinder is, in principle, to be carried out as follows, however, the extent may be extended when deemed necessary by the Surveyor.</p> <p>(B) Examinations are to be carried out while rotating the crank shaft after removing <u>the upper parts of main bearings and crank-pin bearings</u>. The deflection of crank webs are to be measured and where deemed necessary the alignment of the bearing are to be adjusted.</p>	<p style="text-align: center;">〈RULE PART 1〉</p> <p style="text-align: center;">Section 3 Intermediate Survey</p> <p>303. Machinery, electrical installations and additional installations</p> <p>2. Internal combustion engines for main engines</p> <p>(1) Partial open-up survey for one cylinder is, in principle, to be carried out as follows, however, the extent may be extended when deemed necessary by the Surveyor.</p> <p>(B) Examinations are to be carried out while rotating the crank shaft after removing <u>the upper part of the main bearing and crank-pin bearing corresponding to the cylinder opened</u>. The deflection of crank webs are to be measured and where deemed necessary the alignment of the bearing are to be adjusted.</p>	<p>Corrective grammer</p>

Present	Amendments	Reason
<p style="text-align: center;">CHAPTER 2 PERIODICAL AND OTHER SURVEYS</p> <p>1501. General</p> <p>1. Application</p> <p>1. Application</p> <p>(1)In addition to the other requirements specified in Ch 2, the requirements apply to all self-propelled general dry cargo ships of 500 GT and above carrying solid cargoes other than:</p> <p>⟨omitted⟩</p> <p>– general dry cargo ships of double side-skin construction, with double side-skin extending for the length of the cargo area, and for the height of the cargo hold to the upper deck(Special consideration may also given to ships that are of double side-skin construction but with single skin in way of several frames <u>e.g.</u> in way of forebody full form at the forward end of the foremost cargo hold.) (2020)</p> <p>1504. Special Survey</p> <p>7. Additional <u>Annual Survey</u> requirements for single hold cargo ships (See 1501. 1 (1)) after determining compliance with SOLAS II-1/25 (2020)</p>	<p style="text-align: center;">CHAPTER 2 PERIODICAL AND OTHER SURVEYS</p> <p>1501. General</p> <p>1. Application</p> <p>1. Application</p> <p>(1)In addition to the other requirements specified in Ch 2, the requirements apply to all self-propelled general dry cargo ships of 500 GT and above carrying solid cargoes other than:</p> <p>⟨same as the current Rules⟩</p> <p>– general dry cargo ships of double side-skin construction, with double side-skin extending for the length of the cargo area, and for the height of the cargo hold to the upper deck(Special consideration may also given to ships that are of double side-skin construction but with single skin in way of several frames e.g. <u>in way of a cargo hold entrance or</u> in way of forebody full form at the forward end of the foremost cargo hold.) (2020)</p> <p>1504. Special Survey</p> <p>7. Additional Annual Survey requirements for single hold cargo ships (See 1501. 1 (1)) after determining compliance with SOLAS II-1/25 (2020)</p>	<p>– omitted</p> <p>– typo</p>

PART 2

Present	Amendment	Note
<p style="text-align: center;">Present <Guidance> Pt 2</p> <p style="text-align: center;">Annex 2-9 Offshore mooring chain</p> <p>3. Rolled steel bars</p> <p>(1) ~ (2) <Omitted></p> <p>(3) Deoxidation practice and chemical composition <u>(A) <Same as the present Guidance></u></p> <p>(B) The steelmaker is to submit a specification of the chemical composition of the bar material, which must be approved by the Society and by the chain manufacturer. The steel maker is to confirm by analysis and testing that the specification is met. For Grade <i>R4</i>, <i>R4S</i> and <i>R5</i> chain, the steel is to be contained a minimum of 0.20% molybdenum. (2017)</p>	<p style="text-align: center;">Amendment <Guidance> Pt 2</p> <p style="text-align: center;">Annex 2-9 Offshore mooring chain</p> <p>3. Rolled steel bars</p> <p>(1) ~ (2) <Same as the present Guidance></p> <p>(3) Deoxidation practice and chemical composition <u>(A) All steels are to be killed and fine grain treated. The chemical composition of ladle samples of each heat is to be determined by the steel maker and is to comply with the approved specification.</u></p> <p>(B) The steelmaker is to submit a specification of the chemical composition of the bar material, which must be approved by the Society and by the chain manufacturer. The steel maker is to confirm by analysis and testing that the specification is met. For Grade <i>R4</i>, <i>R4S</i> and <i>R5</i> chain, the steel is to be contained a minimum of 0.20% molybdenum. (2017)</p>	<p>Date: 2025.10.16. Person in charge: Choi Daegon</p> <p>Typo</p>

PART 3

Present	Amendment	Reason
<p style="text-align: center;">〈Guidance Part 3〉</p> <p style="text-align: center;">Annex 3-3 Guidance for the Fatigue Strength Assessment of Ship Structures</p> <p>1. General (2020)</p> <p>(1) ~ (2) 〈omitted〉</p> <p>(3) For ships which were checked based on the above fatigue analysis method, following class notation is assigned from (A) to (C), including information about evaluated sea area. NA - North Atlantic WW - Worldwide</p> <p>(A) The method of simplified fatigue analysis : SeaTrust(FSA1[NA(or WW)])</p> <p>(B) The method of fatigue analysis by hold analysis : SeaTrust(FSA2[NA(or WW)])</p> <p>(C) The method of fatigue analysis by global analysis : SeaTrust(FSA3[NA(or WW)])</p> <p>However, in case that SeaTrust(FSA2) or SeaTrust(FSA3) is assigned to ships , SeaTrust(DSA1) is to be performed.</p> <p>(4) ~ (6) 〈omitted〉</p> <p>2. ~ 7. 〈omitted〉 ↓</p>	<p style="text-align: center;">〈Guidance Part 3〉</p> <p style="text-align: center;">Annex 3-3 Guidance for the Fatigue Strength Assessment of Ship Structures</p> <p>1. General (2020)</p> <p>(1) ~ (2) 〈same as the current Rules〉</p> <p>(3) For ships which were checked based on the above fatigue analysis method, following class notation is assigned from (A) to (C), including information about evaluated sea area. NA - North Atlantic WW - Worldwide</p> <p>(A) The method of simplified fatigue analysis : SeaTrust(FSA1[NA(or WW)])</p> <p>(B) The method of fatigue analysis by hold analysis : SeaTrust(FSA2[NA(or WW)])</p> <p>(C) The method of fatigue analysis by global analysis : SeaTrust(FSA3[NA(or WW)])</p> <p>However, in case that SeaTrust(FSA2) or SeaTrust(FSA3) is assigned to ships , SeaTrust(FSA1) is to be performed.</p> <p>(4) ~ (6) 〈same as the current Rules〉</p> <p>2. ~ 7. 〈same as the current Rules〉 ↓</p>	

Present	Amendment	Note
<p style="text-align: center;"><Guidance> – Pt 3</p> <p style="text-align: center;">Ch.1 General</p> <p style="text-align: center;">Section 4 Materials</p> <p>401. Standards of material [See Rule]</p> <p>2. Where no other information is available, the minimum specified yield stress σ_y' and the material factor K of steels used at design temperatures between 90 °C and 300 °C may be taken equal to:</p> <p>(1) Yield stress at higher temperatures</p> $\sigma_y' = \sigma_y \left(1.04 - \frac{0.75}{1000} \theta \right)$ <p>σ_y : the minimum specified yield stress at ambient temperature specified in Pt 2, Ch 1, Sec 3. Table 2.1.7</p> <p>θ : design temperature(°C)</p> <p>(2) Material factor</p> $K = \frac{235}{\sigma_y}$	<p style="text-align: center;"><Guidance> – Pt 3</p> <p style="text-align: center;">Ch.1 General</p> <p style="text-align: center;">Section 4 Materials</p> <p>401. Standards of material [See Rule]</p> <p>2. Where no other information is available, the minimum specified yield stress σ_y' and the material factor K of steels used at design temperatures between 90 °C and 300 °C may be taken equal to:</p> <p>(1) Yield stress at higher temperatures</p> $\sigma_y' = \sigma_y \left(1.04 - \frac{0.75}{1000} \theta \right)$ <p>σ_y : the minimum specified yield stress at ambient temperature specified in Pt 2, Ch 1, Sec 3. Table 2.1.7</p> <p>θ : design temperature(°C)</p> <p>(2) Material factor</p> $K = \frac{235}{\sigma_y'}$	<p style="text-align: right;">-HUT4000-2037-20 25 $\sigma_y \rightarrow \sigma_y'$ (Eng. only)</p>

Present	Amendment	Note
<p style="text-align: center;"><Guidance> – Pt 3</p> <p style="text-align: center;">Ch 14 WATERTIGHT BULKHEAD</p> <p style="text-align: center;">Section 4 Watertight Door</p> <p>402. Type of watertight doors [See Rule]</p> <p>2. For passenger ships the watertight doors and their controls are to be located in compliance with Table 3.14.3 and SOLAS II-1/13.5.3, II-1/13.7.1.2.2. (2020)</p>	<p style="text-align: center;"><Guidance> – Pt 3</p> <p style="text-align: center;">Ch 14 WATERTIGHT BULKHEAD</p> <p style="text-align: center;">Section 4 Watertight Door</p> <p>402. Type of watertight doors [See Rule]</p> <p>2. For passenger ships the watertight doors and their controls are to be located in compliance with Table 3.14.3 and SOLAS II-1/13.5.3, II-1/13.6.1.2.2. (2020)</p>	<p>- “7” → “6”</p>

PART 7

Present

<Guidance> - Pt 7

Ch 10 DOUBLE HULL TANKER

Section 4 Girders

405. Girders and transverses in cargo oil tanks and deep tanks
[See Rule]

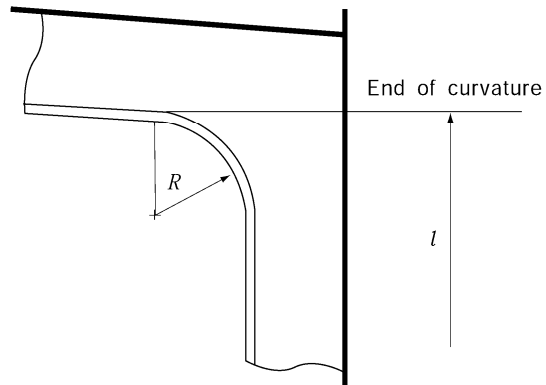


Fig 7.10.3 Measured method of *S*

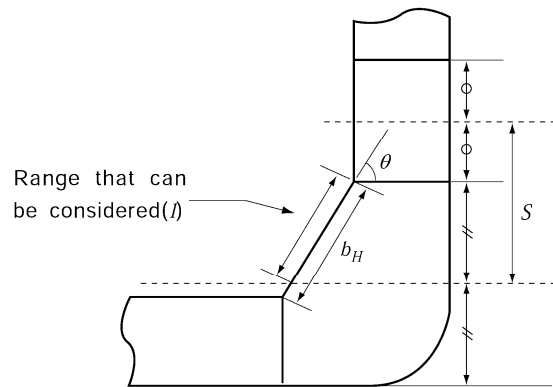


Fig 7.10.4 Measured method of *S*

Amendment

<Guidance> - Pt 7

Ch 10 DOUBLE HULL TANKER

Section 4 Girders

405. Girders and transverses in cargo oil tanks and deep tanks
[See Rule]

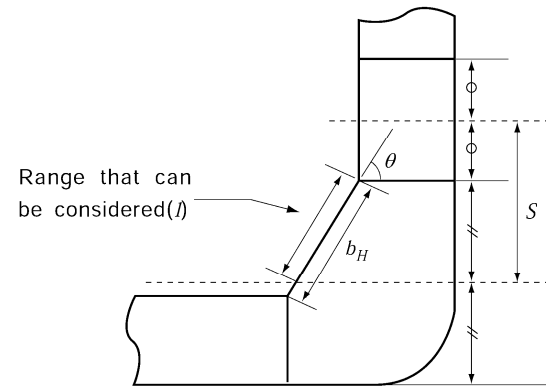


Fig 7.10.4 Measured method of *S*

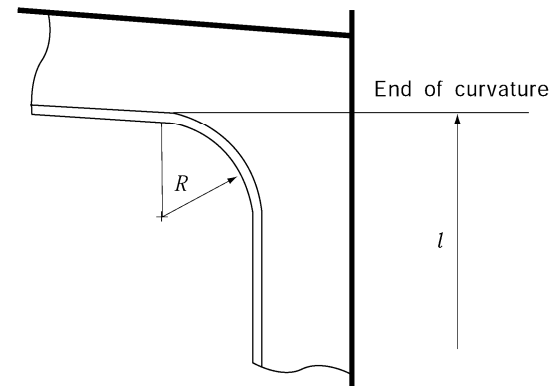


Fig 7.10.5 Measured method of *l*

Note

-error

Present	Amendment	Note
<p data-bbox="91 217 488 245">Table 7.10.5 Thickness of floor t_1</p> <p data-bbox="129 296 981 427">C_2 = coefficient obtained from Table 7.10.6 <u>and</u> Table 7.10.8 depending on b/l_T. For intermediate values of C_2 is to be obtained by linear interpolation.</p> <p data-bbox="197 603 663 632">Annex 7-9 198P ~ 204P 꼬리말 <u>2024</u></p>	<p data-bbox="999 217 1395 245">Table 7.10.5 Thickness of floor t_1</p> <p data-bbox="1037 296 1888 427">C_2 = coefficient obtained from Table 7.10.6 <u>to</u> Table 7.10.8 depending on b/l_T. For intermediate values of C_2 is to be obtained by linear interpolation.</p> <p data-bbox="1104 595 1688 624">Annex 7-9 책페이지 198P ~ 204P 꼬리말 <u>2025</u></p>	

PART 7 (CH5, 6)

PART 7 Ships of Special Service (Ch 5, 6)

Annex 7B-1 Table of Summary of Minimum Requirements (2021)

⟨Omitted⟩

Note :	
Subindex a) ~ (m)	⟨omitted⟩
Subindex (a)	<u>If the product to be carried contains flammable solvents such that the flashpoint does not exceed 60°C, then special electrical systems and a flammable-vapour detector shall be provided.</u>
Subindex (b)	<u>Although water is suitable for extinguishing open-air fires involving chemicals to which this footnote applies, water shall not be allowed to contaminate closed tanks containing these chemicals because of the risk of hazardous gas generation.</u>
Subindex (c)	<u>Phosphorus, yellow or white, is carried above its autoignition temperature and therefore flashpoint is not appropriate. Electrical equipment requirements may be similar to those for substances with a flashpoint above 60°C.</u>
Subindex (d)	<u>Requirements are based on those isomers having a flashpoint of 60°C or less; some isomers have a flashpoint greater than 60°C and therefore the requirements based on flammability would not apply to such isomers.</u>
Subindex (e)	<u>Applies to n-decyl alcohol only.</u>
Subindex (f)	<u>Dry chemical shall not be used as fire-extinguishing media.</u>
Subindex (g)	<u>Confined spaces shall be tested for both formic acid vapours and carbon monoxide gas, a decomposition product.</u>
Subindex (h)	<u>Applies to p-xylene only.</u>
Subindex (i)	<u>For mixtures containing no other components with safety hazards and where the pollution category is Y or less.</u>
Subindex (j)	<u>Only certain alcohol-resistant foams are effective.</u>
Subindex (k)	<u>Requirements for Ship Type identified in column e might be subject to regulation 4.1.3 of Annex II of MARPOL.</u>
Subindex (l)	<u>Applicable when the melting point is equal to or greater than 0°C.</u>
Subindex (m)	<u>From vegetable oils, animal fats and fish oils specified in the IBC Code.</u>
Subindex (n)	Confirmation that the product is composed of Triglycerides, C16-C18 and C18 unsaturated shall be required in order for the entry to be used. Otherwise, the more generic entry "Used cooking oil (m)" must be used.
Subindex (o)	Indicates that the entries are to be used solely for backloading of contaminated bulk liquids from offshore installations used in the search and exploitation of seabed mineral resources.
Subindex (*)	Indicates that with reference to Annex 7B-4(101.3), deviations from the normal assignment criteria used for some carriage requirements have been implemented.

- Editorial error corrected.

Present	Amendment	Note
<p style="text-align: center;"><Guidance> – Pt 7</p> <p>Ch.5 Ships Carrying Liquefied Gases in Bulk</p> <p style="text-align: center;">Section 3 Ship Arrangements</p> <p>303. Cargo machinery spaces and turret compartments [See Rule]</p> <p>1. Location <omit></p> <p>2. Cargo pumps and cargo compressors</p> <p>(1) Shaft seals such as those manually feeding grease periodically are not considered as the <u>"other means of ensuring the permanence of the gas seal"</u> referred to in 303. 4 of the Rules.</p> <p>(2) The arrangement of motor rooms housing electric motors driving cargo pumps and cargo compressors referred to in 303. 4 of the Rules is to be as, for example, shown in Fig 7.5.11 (1) of the Guidance. If the arrangement can not be complied with the above requirement in case of such as a small ship, it may be as, for example, shown in Fig 7.5.11 (2) of the Guidance, where the openings of compartments such as chain lockers considered as the source of ignition are provided in the motor rooms, however, the openings are to be closed by steel watertight covers fitted with warning signs stating that "The openings are to be always kept closed. If opened, the motor room is to be sufficiently ventilated."</p> <p>(3) The motor rooms referred to in the preceding (1) are to be arranged in non-hazardous spaces.</p> <p>3. Drainage <omit></p>	<p style="text-align: center;"><Guidance> – Pt 7</p> <p>Ch.5 Ships Carrying Liquefied Gases in Bulk</p> <p style="text-align: center;">Section 3 Ship Arrangements</p> <p>303. Cargo machinery spaces and turret compartments [See Rule]</p> <p>1. Location <same as present></p> <p>2. Cargo pumps and cargo compressors</p> <p>(1) Shaft seals such as those manually feeding grease periodically are not considered as the <u>"effective gastight segregation of the two space"</u> referred to in 303. 4 of the Rules.</p> <p>(2) The arrangement of motor rooms housing electric motors driving cargo pumps and cargo compressors referred to in 303. 4 of the Rules is to be as, for example, shown in Fig 7.5.11 (1) of the Guidance. If the arrangement can not be complied with the above requirement in case of such as a small ship, it may be as, for example, shown in Fig 7.5.11 (2) of the Guidance, where the openings of compartments such as chain lockers considered as the source of ignition are provided in the motor rooms, however, the openings are to be closed by steel watertight covers fitted with warning signs stating that "The openings are to be always kept closed. If opened, the motor room is to be sufficiently ventilated."</p> <p>(3) The motor rooms referred to in the preceding (2) are to be arranged in non-hazardous spaces.</p> <p>3. Drainage <same as present></p>	<p>- Item not revised at the time of the New IGC revision</p> <p>- reference error</p>

Present	Amendment	Reason
<p style="text-align: center;"><Rule Pt 7 Ch 5, 6></p> <p style="text-align: center;">Section 11 Fire Protection and Fire Extinction</p> <p>1101. 1102. <omitted></p> <p>1103. Water spray system</p> <p>1. Area to be covered [See Rule] (1) to (2) <omitted> <newly added></p> <p>(3) to (4) <omitted></p> <p>2. to 8. <omitted></p> <p>1104. Dry chemical powder fire-extinguishing systems [See Rule]</p> <p>1. <omitted> <newly added></p> <p>2. to 4. <omitted></p>	<p style="text-align: center;"><Rule Pt 7 Ch 5, 6></p> <p style="text-align: center;">Section 11 Fire Protection and Fire Extinction</p> <p>1101. 1102. <same as the present></p> <p>1103. Water spray system</p> <p>1. Area to be covered [See Rule] (1) to (2) <same as the present> (3) <u>For the purpose of the requirements in 1103.1 (4) and (5) of Rules, where vessels is provided with additional cargo transfer equipment including transfer loading arms, bunkering booms, transfer hoses, reducers, spool pieces and transfer hoses reels, this additional cargo transfer equipment is to comply with Annex 7A-3, 701.3.(2024)</u></p> <p>(4) to (5) <same as the present></p> <p>2. to 8. <same as the present></p> <p>1104. Dry chemical powder fire-extinguishing systems [See Rule]</p> <p>1. <same as the present></p> <p>2. <u>For the purpose of the requirements in 1104.1 and 3 of Rules, where vessels is provided with additional cargo transfer equipment including transfer loading arms, bunkering booms, transfer hoses, reducers, spool pieces and transfer hoses reels, this additional cargo transfer equipment is to comply with Annex 7A-3, 701.3.(2024)</u></p> <p>3. to 5. <same as the present></p>	

현행	개정안	개정사유
<p style="text-align: center;"><Guidance Pt 7 Ch 5, 6> Section 18 Operating Requirements</p> <p>1809. <omitted></p> <p>1810. Cargo emergency shutdown (ESD) system</p> <p>1. to 2. <omitted></p> <p><newly added></p>	<p style="text-align: center;"><Guidance Pt 7 Ch 5, 6> Section 18 Operating Requirements</p> <p>1809. <omitted></p> <p>1810. Cargo emergency shutdown (ESD) system</p> <p>1. to 2. <omitted></p> <p>3. For the purpose of the requirements in 1801.3 (2) of Rules, <u>where vessels is provided with additional cargo transfer equipment including transfer loading arms, bunkering booms, transfer hoses, reducers, spool pieces and transfer hoses reels, this additional cargo transfer equipment is to comply with Annex 7A-3, 701.3.(2024)</u></p>	

현행	개정안	개정사유
<p style="text-align: center;"><Guidance Pt 7 Ch 5, 6> Annex 7A-3 LNG Bunkering Systems</p> <p style="text-align: center;">Section 1 to Section 6 <omitted></p> <p style="text-align: center;">Section 7 Fire Protection and Fire Extinction</p> <p>701. General</p> <ol style="list-style-type: none"> 1. Water spray systems are to be installed at the bunkering manifold area in accordance with Ch 5, 1103. of the Rules. 2. Dry chemical powder fire-extinguishing systems is to be installed at the bunkering manifold area in accordance with Ch 5, 1104. of the Rules. <p><Newly added></p>	<p style="text-align: center;"><Guidance Pt 7 Ch 5, 6> Annex 7A-3 LNG Bunkering Systems</p> <p style="text-align: center;">Section 1 to Section 6 <omitted></p> <p style="text-align: center;">Section 7 Fire Protection and Fire Extinction</p> <p>701. General</p> <ol style="list-style-type: none"> 1. Water spray systems are to be installed at the bunkering manifold area in accordance with Ch 5, 1103. of the Rules. 2. Dry chemical powder fire-extinguishing systems is to be installed at the bunkering manifold area in accordance with Ch 5, 1104. of the Rules. 3. For vessels provided with additional cargo transfer equipment <u>including transfer loading arms, bunkering booms, transfer hoses, reducers, spool pieces and transfer hoses reels, when in use, this additional cargo transfer equipment shall comply, where appropriate, with the requirements of 1103.1 (4), 1103.1 (5), 1104.1, 1104.3 and 1810.3 (2) of Rules for fire detection and fire protection in the cargo area (such as fusible elements, ESD functionality, water spray system protection, dry chemical powder fire-extinguishing systems and drip trays) including hull protection from low temperatures.</u> 	

Present	Amendment	Note																																																																																																																								
<p style="text-align: center;">〈Guidance〉 - Pt 7</p> <p style="text-align: center;">Annex 7-2 Guidance for the Container Securing Arrangements</p> <p>Table 8 Specific sea route reduction factor</p> <table border="1" data-bbox="147 464 969 1390"> <thead> <tr> <th>Route</th> <th>f_r</th> <th>f_p</th> <th>f_h</th> </tr> </thead> <tbody> <tr> <td>Asia-Europe service</td> <td>$-0.00041B+0.8907$</td> <td><u>0.866</u></td> <td><u>0.902</u></td> </tr> <tr> <td>Pacific service</td> <td>$-0.00146B+0.9709$</td> <td><u>0.862</u></td> <td><u>0.996</u></td> </tr> <tr> <td>Pacific-Atlantic service</td> <td>$-0.00074B+0.9641$</td> <td><u>0.915</u></td> <td><u>0.981</u></td> </tr> <tr> <td>North Sea-Mediterranean Short Sea service</td> <td>$-0.00025B+0.9446$</td> <td><u>0.928</u></td> <td><u>0.954</u></td> </tr> <tr> <td>North Atlantic service</td> <td>1</td> <td><u>1</u></td> <td><u>1</u></td> </tr> <tr> <td>Asia-South America(West Coast)</td> <td>$-0.00090B+0.9452$</td> <td><u>0.873</u></td> <td><u>0.970</u></td> </tr> <tr> <td>South America(East Coast)-Africa</td> <td>$0.00094B+0.8475$</td> <td><u>0.831</u></td> <td><u>0.873</u></td> </tr> <tr> <td>Africa-East Asia</td> <td>$0.00087B+0.9034$</td> <td><u>0.875</u></td> <td><u>0.885</u></td> </tr> <tr> <td>Europe(Rotterdam)-Africa</td> <td>$-0.00009B+0.9118$</td> <td><u>0.905</u></td> <td><u>0.914</u></td> </tr> <tr> <td>Europe(Rotterdam)_South America(Brazil)</td> <td>$-0.00020B+0.9265$</td> <td><u>0.916</u></td> <td><u>0.932</u></td> </tr> <tr> <td>US(NYC)-South America(Brazil)</td> <td>$-0.00062B+0.8084$</td> <td><u>0.760</u></td> <td><u>0.826</u></td> </tr> <tr> <td>Asia-Middle East Asia</td> <td>$-0.0026B+0.8418$</td> <td><u>0.628</u></td> <td><u>0.851</u></td> </tr> <tr> <td>Intra Asia</td> <td>$-0.0024B+0.8508$</td> <td><u>0.649</u></td> <td><u>0.865</u></td> </tr> <tr> <td style="text-align: center;">-</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Route	f_r	f_p	f_h	Asia-Europe service	$-0.00041B+0.8907$	<u>0.866</u>	<u>0.902</u>	Pacific service	$-0.00146B+0.9709$	<u>0.862</u>	<u>0.996</u>	Pacific-Atlantic service	$-0.00074B+0.9641$	<u>0.915</u>	<u>0.981</u>	North Sea-Mediterranean Short Sea service	$-0.00025B+0.9446$	<u>0.928</u>	<u>0.954</u>	North Atlantic service	1	<u>1</u>	<u>1</u>	Asia-South America(West Coast)	$-0.00090B+0.9452$	<u>0.873</u>	<u>0.970</u>	South America(East Coast)-Africa	$0.00094B+0.8475$	<u>0.831</u>	<u>0.873</u>	Africa-East Asia	$0.00087B+0.9034$	<u>0.875</u>	<u>0.885</u>	Europe(Rotterdam)-Africa	$-0.00009B+0.9118$	<u>0.905</u>	<u>0.914</u>	Europe(Rotterdam)_South America(Brazil)	$-0.00020B+0.9265$	<u>0.916</u>	<u>0.932</u>	US(NYC)-South America(Brazil)	$-0.00062B+0.8084$	<u>0.760</u>	<u>0.826</u>	Asia-Middle East Asia	$-0.0026B+0.8418$	<u>0.628</u>	<u>0.851</u>	Intra Asia	$-0.0024B+0.8508$	<u>0.649</u>	<u>0.865</u>	-				<p style="text-align: center;">〈Guidance〉 - 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Present	Amendment	Note
<p style="text-align: center;">〈Guidance〉 – Pt 7</p> <p style="text-align: center;">Ch. 10 DOUBLE HULL TANKER</p> <p style="text-align: center;">Section 4 Girders</p> <p>403. Scantlings of girders and floors in double bottom 【See Rule】</p> <p>1.</p> <p>(1)</p> <p>C_1 = coefficient obtained from Table 7.10.2 and Table 7.10.3 depending on b/l_T. For intermediate values of C_1 is to be obtained by linear interpolation.</p> <p>b = distance between the side shell plating and the longitudinal bulkhead on the centreline of the hull at the top of the inner bottom plating at the midship part (m).</p> <p>l_T = length of the cargo oil tank under consideration (m).</p>	<p style="text-align: center;">〈Guidance〉 – Pt 7</p> <p style="text-align: center;">Ch. 10 DOUBLE HULL TANKER</p> <p style="text-align: center;">Section 4 Girders</p> <p>403. Scantlings of girders and floors in double bottom 【See Rule】</p> <p>1.</p> <p>(1)</p> <p>C_1 = coefficient obtained from Table 7.10.2 and Table 7.10.3 depending on b/l_T. For intermediate values of C_1 is to be obtained by linear interpolation.</p> <p>b = <u>For Type A tankers, the distance between the side shell plating and the longitudinal bulkhead (m).</u> <u>For Type C tankers, the distance between longitudinal bulkheads (m).</u> However, if a bilge hopper tank is installed, the distance is measured from the inner edges of the hopper tank. <u>For Type D tankers, the distance (m) between the longitudinal bulkhead for double-hull structure and the longitudinal bulkhead at the centerline. However, if a bilge hopper is installed, the distance is measured from the inner edges of the hopper tank.</u> <u>The "b" is measured from the top surface of the inner bottom at the center of L (m).</u></p> <p>l_T = length of the cargo oil tank under consideration (m).</p>	<p>-HUT1000-2039-2025 (omission) (Eng. only)</p> <p>A형 유조선인 경우에는 종격벽으로부터 선측외판까지의 거리 (m). C형 유조선인 경우에는 종격벽사이의 거리 (m). 다만, 발지호퍼탱크가 설치된 경우에는 호퍼탱크 내 단간의 거리로 한다. D형 유조선인 경우에는 이중선측구조용 종격벽과 선체중심선 종격벽간의 거리 (m)로 한다. 다만, 발지호퍼가 설치된 경우에는 이것의 내단으로부터 측정된 거리로 한다. b의 측정 은 L의 중앙에 있어서 내저판 상면에서 측정한다.</p>

PART 8

Present	Amendment	Note
<p style="text-align: center;">〈Guidance〉 – Pt 8</p> <p style="text-align: center;">Ch.7 Containment of Fire</p> <p style="text-align: center;">Section 6 Ventilation Systems [See Rule]</p> <p>601. ~ 604. 〈omit〉</p> <p>605. Exhaust ducts from galley ranges (2017)</p> <ol style="list-style-type: none"> 1. 〈same as present〉 2. 〈same as 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. ⚓ 	<p style="text-align: center;">〈Guidance〉 – Pt 8</p> <p style="text-align: center;">Ch.7 Containment of Fire</p> <p style="text-align: center;">Section 6 Ventilation Systems [See Rule]</p> <p>601. ~ 604. 〈same as present〉</p> <p>605. Exhaust ducts from galley ranges (2017)</p> <ol style="list-style-type: none"> 1. 〈same as present〉 2. 〈same as 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. <u>The provisions of this 3 should be applied to ships built before January 1, 2016.</u> ⚓ 	<p>– IACS UI SC118 (Rev.2) Exhaust duct from galley ranges</p> <p>(1) The above UI was reflected in the Guidance Pt.8, Ch.7, Sec.6 605.3. At the time of the revision of this UI in 2015 (Rev.2), it was limited to be applied only to ships built before January 1, 2016, but it was not reflected.</p> <p>(2) In order to refer to ships built before 2016, it was decided to add only the phrase that the relevant provision apply to ships built before 2016 (error processing).</p>

PART 9

Present	Amendment	Note
<p style="text-align: center;"><Rule Pt 9></p> <p style="text-align: center;">CHAPTER 2 CARGO HANDLING APPLIANCES</p> <p style="text-align: center;">Section 4 Crane</p> <p>403. Strength and Construction</p> <p>8. Fixed Posts</p> <p>(1) The fixed posts are to be effectively connected to the hull structure in accordance with the requirements in 303. 4 (1).</p> <p>(2) The upper part of fixed post where the flange is attached is to be sufficiently reinforced by increasing the plate thickness or by providing of-brackets.</p>	<p style="text-align: center;"><Rule Pt 9></p> <p style="text-align: center;">CHAPTER 2 CARGO HANDLING APPLIANCES</p> <p style="text-align: center;">Section 4 Crane</p> <p>403. Strength and Construction</p> <p>8. Fixed Posts</p> <p>(1) The fixed posts are to be effectively connected to the hull structure in accordance with the requirements in 303. 6 (1).</p> <p>(2) The upper part of fixed post where the flange is attached is to be sufficiently reinforced by increasing the plate thickness or by providing brackets.</p>	<p>-correction of editorial error/ grammatical error for</p>

Present	Amendment	Note
<p style="text-align: center;">〈Guidance〉 – Pt 9 Section 2 Surveys</p> <p>203. Registration Surveys</p> <p>1. Registration survey during Construction (2025)</p> <p>(1) Drawings and Other Documents to be Submitted 〔See Rule〕</p> <p>(B)</p> <p>(c) Others: Where the machinery is installed in ships under the classification of the Society for the first time, the requirements in (B) above are to be applied even when the output is less than 375 kW.</p> <p>(2) Examinations for Workmanship 〔See Rule〕</p> <p>(A) Tests and examinations for driving machines, etc. for cargo gear and cargo ramps are to be in accordance with the following requirements (A) to (D):</p> <p>(a) Hydraulic motors and regulating valves attached thereto:</p> <p>(iii) Notwithstanding the requirements (a) and (b) where the driving machines are installed on the class ship of the Society for the first time, the hydraulic test, performance verification test, and open-up examination are all to be carried out in the presence of the Surveyor.</p> <p>(b) Hydraulic pumps: Hydraulic pumps are to be dealt with in similar ways to (A) (a) to (c) above depending on the outputs of the driving motors.</p> <p>(c) Steam cylinders, pneumatic motors and internal combustion engines: These are to be dealt with in similar ways to (A) (a) to (c) above depending on each output. The hydraulic tests for the steam cylinders are to be carried out at a pressure of 1.5 times the design steam pressure and those for the valves directly connected to the cylinder are to be carried out at a pressure of 2 times the design steam pressure.</p>	<p style="text-align: center;">〈Guidance〉 – Pt 9 Section 2 Surveys</p> <p>203. Registration Surveys</p> <p>1. Registration survey during Construction (2025)</p> <p>(1) Drawings and Other Documents to be Submitted 〔See Rule〕</p> <p>(B)</p> <p>(c) Others: Where the machinery is installed in ships under the classification of the Society for the first time, the requirements in (b) above are to be applied even when the output is less than 375 kW.</p> <p>(2) Examinations for Workmanship 〔See Rule〕</p> <p>(A) Tests and examinations for driving machines, etc. for cargo gear and cargo ramps are to be in accordance with the following requirements (a) to (d):</p> <p>(a) Hydraulic motors and regulating valves attached thereto:</p> <p>(iii) Notwithstanding the requirements (i) and (ii) where the driving machines are installed on the class ship of the Society for the first time, the hydraulic test, performance verification test, and open-up examination are all to be carried out in the presence of the Surveyor.</p> <p>(b) Hydraulic pumps: Hydraulic pumps are to be dealt with in similar ways to (a) (i) to (iii) above depending on the outputs of the driving motors.</p> <p>(c) Steam cylinders, pneumatic motors and internal combustion engines: These are to be dealt with in similar ways to (a) (i) to (iii) above depending on each output. The hydraulic tests for the steam cylinders are to be carried out at a pressure of 1.5 times the design steam pressure and those for the valves directly connected to the cylinder are to be carried out at a pressure of 2 times the design steam pressure.</p> <p style="text-align: center;">– 1 –</p>	<p>-correction of editorial error/ grammatical error for</p>

Present	Amendment	Note
<p style="text-align: center;">〈Rule Pt 9〉</p> <p style="text-align: center;">CHAPTER 3 AUTOMATIC AND REMOTE CONTROL SYSTEMS</p> <p style="text-align: center;">Section 3 Centralized Monitoring and Control Systems for Main Propulsion and Essential Auxiliary Machinery</p> <p>304. Centralized monitoring and control systems</p> <p style="padding-left: 20px;">2. Centralized monitoring and control systems for main propulsion and essential auxiliary machinery</p> <p style="padding-left: 40px;">(7) Emergency stopping devices for main propulsion machinery specified in <u>305. 2 (3) (E)</u>.</p> <p style="text-align: center;">Section 4 Operating Systems for Periodically Unattended Machinery Spaces</p> <p>402. Monitoring and control systems in navigation</p> <p style="padding-left: 20px;">1. Bridge control devices</p> <p style="padding-left: 40px;">The bridge control devices specified in <u>305. 3</u> are to be provided in the navigation bridge. The bridge control devices provided in the navigation bridge or at the bridge the centralized monitoring and control station are to include the following devices:</p>	<p style="text-align: center;">〈Rule Pt 9〉</p> <p style="text-align: center;">CHAPTER 3 AUTOMATIC AND REMOTE CONTROL SYSTEMS</p> <p style="text-align: center;">Section 3 Centralized Monitoring and Control Systems for Main Propulsion and Essential Auxiliary Machinery</p> <p>304. Centralized monitoring and control systems</p> <p style="padding-left: 20px;">2. Centralized monitoring and control systems for main propulsion and essential auxiliary machinery</p> <p style="padding-left: 40px;">(7) Emergency stopping devices for main propulsion machinery specified in Part 6 202.2 (3) (E).</p> <p style="text-align: center;">..</p> <p style="text-align: center;">Section 4 Operating Systems for Periodically Unattended Machinery Spaces</p> <p>402. Monitoring and control systems in navigation</p> <p style="padding-left: 20px;">1. Bridge control devices</p> <p style="padding-left: 40px;">The bridge control devices specified in Part 6 Ch.2 202.3 . are to be provided in the navigation bridge. The bridge control devices provided in the navigation bridge or at the bridge the centralized monitoring and control station are to include the following devices:</p>	<p>– Edited for numbering error.</p>

Present	Amendment	Note
<p style="text-align: center;"><Rule Pt 9></p> <p style="text-align: center;">CHAPTER 3 AUTOMATIC AND REMOTE CONTROL SYSTEMS</p> <p style="text-align: center;">Section 2 Surveys of Automatic and Remote Control Systems</p> <p>205. Sea trials for the centralized monitoring and control systems for main propulsion and essential auxiliary machinery</p> <p>1. Main propulsion machinery and controllable pitch propellers [See Guidance]</p> <p>(3) In case where there are two or more control stations for main propulsion machinery or controllable pitch propellers, the test on transfer of control is to be carried out during ahead and astern operations of the main propulsion machinery or the controllable pitch propellers. In case where the transfer of control of the remote control devices for main propulsion machinery or controllable pitch propellers is carried out in accordance with <u>305. 2 (2) (C) (b)</u>, the above-mentioned test may be carried out during the stopping condition of the main propulsion machinery</p> <p style="text-align: center;">Section 4 Operating Systems for Periodically Unattended Machinery Spaces.</p> <p>3. Bridge centralized monitoring and control station</p> <p>(1) The alarm devices provided at the bridge centralized monitoring and control station are to comply with the following requirements.</p> <p>(A) At least the following visual alarms of alarms required in 304. 2 (6) are to be equipped at confirmable positions from the place to control the operating handle of the main propulsion machinery.</p> <p>(c) The alarms for failure of remote control systems specified in 305. 2 (3) (A)</p>	<p style="text-align: center;"><Rule Pt 9></p> <p style="text-align: center;">CHAPTER 3 AUTOMATIC AND REMOTE CONTROL SYSTEMS</p> <p style="text-align: center;">Section 2 Surveys of Automatic and Remote Control Systems</p> <p>205. Sea trials for the centralized monitoring and control systems for main propulsion and essential auxiliary machinery</p> <p>1. Main propulsion machinery and controllable pitch propellers [See Guidance]</p> <p>(3) In case where there are two or more control stations for main propulsion machinery or controllable pitch propellers, the test on transfer of control is to be carried out during ahead and astern operations of the main propulsion machinery or the controllable pitch propellers. In case where the transfer of control of the remote control devices for main propulsion machinery or controllable pitch propellers is carried out in accordance with Pt 6 Sec. 2 202. 2 (2) (C) (b), the above-mentioned test may be carried out during the stopping condition of the main propulsion machinery.</p> <p style="text-align: center;">Section 4 Operating Systems for Periodically Unattended Machinery Spaces.</p> <p>3. Bridge centralized monitoring and control station</p> <p>(1) The alarm devices provided at the bridge centralized monitoring and control station are to comply with the following requirements.</p> <p>(A) At least the following visual alarms of alarms required in 304. 2 (6) are to be equipped at confirmable positions from the place to control the operating handle of the main propulsion machinery.</p> <p>(c) The alarms for failure of remote control systems specified in Pt 6 Sec. 2 (3) (A)</p>	<p>– Edited for numbering error.</p>

Guidance

Present	Amendment	Note
<p><Guidance Pt 9></p> <p>CHAPTER 3 AUTOMATIC AND REMOTE CONTROL SYSTEMS</p> <p>Section 3 Centralized Monitoring and Control Systems for Main Propulsion and Essential Auxiliary Machinery <i>(2025)</i></p> <p>306. Automatic and remote control of boilers</p> <p>1. General (2020) [See Rule]</p> <p><u>In application to 306. 1 (3) of the Rules, the term "deemed appropriate by the Society" means the acceptance in accordance with Pt 1, Ch 1, 104. of the Rules.</u></p>	<p><Guidance Pt 9></p> <p>CHAPTER 3 AUTOMATIC AND REMOTE CONTROL SYSTEMS</p> <p>Section 3 Centralized Monitoring and Control Systems for Main Propulsion and Essential Auxiliary Machinery <i>(2025)</i></p> <p>306. Automatic and remote control of boilers</p> <p>1. General (2020) [See Rule]</p> <p>In application to 306. 1 (3) of the Rules, the term "deemed appropriate by the Society" means the acceptance in accordance with Pt 1, Ch 1, 104. of the Rules.</p>	<p>Deleted.</p> <p>Refer to the Pt.6 Sec 2. 203.</p>

PART 10

Present	Amendment	Note
<p style="text-align: center;">〈Pt 10〉 – Rule</p> <p style="text-align: center;">Ch 6 SINGLE BOTTOMS</p> <p style="text-align: center;">Section 1 General</p> <p>101. Application The requirements in this Chapter apply to ships whose double bottom is omitted partially or wholly in accordance with the requirements in Ch 7, 101. <u>2 to 3</u>.</p> <p style="text-align: center;">Ch 14 WATERTIGHT BULKHEADS</p> <p style="text-align: center;">Section 3 Watertight Doors</p> <p>308. Notices 【See Guidance】 1. As specified in Pt 3, Ch 14, 408. of the Rules.</p> <p style="text-align: center;">Ch 17 MACHINERY SPACES AND ENGINE CASINGS</p> <p style="text-align: center;">Section 5 Machinery Space Openings</p> <p>502. Exposed machinery space casings 1. Exposed machinery space casings are to have scantlings not less than those required in Ch 16, 201. and 202., taking <u>C value</u> as 1.0.</p>	<p style="text-align: center;">〈Pt 10〉 – Rule</p> <p style="text-align: center;">Ch 6 SINGLE BOTTOMS</p> <p style="text-align: center;">Section 1 General</p> <p>101. Application The requirements in this Chapter apply to ships whose double bottom is omitted partially or wholly in accordance with the requirements in Ch 7, 101. <u>3 to 4</u>.</p> <p style="text-align: center;">Ch 14 WATERTIGHT BULKHEADS</p> <p style="text-align: center;">Section 3 Watertight Doors</p> <p>308. Notices 【See Guidance】 1. As specified in Pt 3, Ch 14, 408. of the Rules.</p> <p style="text-align: center;">Ch 17 MACHINERY SPACES AND ENGINE CASINGS</p> <p style="text-align: center;">Section 5 Machinery Space Openings</p> <p>502. Exposed machinery space casings 1. Exposed machinery space casings are to have scantlings not less than those required in Ch 16, 201. and 202., taking <u>c value</u> as 1.0.</p>	<p>– error</p> <p>– error</p> <p>– error (C → c)</p>

PART 14

Present	Amendment	Note
<p style="text-align: center;">Chapter 4 Loads</p> <p style="text-align: center;">Section 1 ~ 4 <omitted></p> <p style="text-align: center;">Section 5 External Loads</p> <p>1. ~ 2. <omitted></p> <p>3. External impact pressures</p> <p>3.1 <omitted></p> <p>3.2 Equivalent design pressure</p> <p>3.2.1 <omitted></p> <p>3.2.2 Breaking wave impact pressure</p> <p>The breaking wave impact pressure, P_{BI} in kN/m^2, is to be taken as: $P_{BI} = CP_B$ where: C : Vertical distribution coefficient, as given in [3.2.1]. C_w : Wave coefficient, as defined in Sec 4. h_0 : Vertical distance, in m, as given in [3.2.1]. P_B : Impact pressure, in kN/m^2. $P_B = \frac{1}{2} \rho K_B V_B^2 C_\phi$ K_B : Coefficient, to be taken as: $K_B = 4$ <omitted></p>	<p style="text-align: center;">Chapter 4 Loads</p> <p style="text-align: center;">Section 1 ~ 4 <same as the present></p> <p style="text-align: center;">Section 5 External Loads</p> <p>1. ~ 2. <same as the present></p> <p>3. External impact pressures</p> <p>3.1 <same as the present></p> <p>3.2 Equivalent design pressure</p> <p>3.2.1 <same as the present></p> <p>3.2.2 Breaking wave impact pressure</p> <p>The breaking wave impact pressure, P_{BI} in kN/m^2, is to be taken as: $P_{BI} = CP_B$ where: C : Vertical distribution coefficient, as given in [3.2.1]. C_w : Wave coefficient, as defined in Sec 4. h_0 : Vertical distance, in m, as given in [3.2.1]. P_B : Impact pressure, in kN/m^2. $P_B = \frac{1}{2} \rho K_B V_B^2 C_\phi$ K_B : Coefficient, to be taken as: $K_B = 4$ $K_B = 0.023L$ but not less than 4 nor greater than 7.5 <same as the present></p>	<p>- adjustment of the coefficient for considering the ship length</p>

Present	Amendment	Note
<p>3.3 <omitted></p> <p>3.4 Bow impact</p> <p>3.4.1 Design pressures</p> <p>The bow impact pressure, P_{FB} in kN/m², to be considered for the bow impact design load scenario is to be taken as:</p> $P_{FB} = \max(P_{EI}, P_{BI}) \cdot f_{FB}$ <p>where:</p> <p>P_{EI} : Entry impact pressure, in kN/m², as defined in [3.2.1].</p> <p>P_{BI} : Breaking wave impact pressure, in kN/m², as defined in [3.2.2].</p> <p>f_{FB} : Longitudinal distribution factor along the ship length, to be taken as follow but not to be taken greater than 1.0:</p> $f_{FB} = 2.8 \left(f_{xL} + 1.5 \frac{L}{2500} - 0.12 \right)^2 - 1.4 \quad \text{for } L \leq 200\text{m}$ $f_{FB} = 2.8 f_{xL}^2 - 1.4 \quad \text{for } L > 200\text{m}$	<p>3.3 <same as present></p> <p>3.4 Bow impact</p> <p>3.4.1 Design pressures</p> <p>The bow impact pressure, P_{FB} in kN/m², to be considered for the bow impact design load scenario is to be taken as:</p> $P_{FB} = \max(f_{FB-EI} P_{EI} \cdot f_{FB-BI} C_{FB} P_{BI})$ <p>where:</p> <p>P_{EI} : Entry impact pressure, in kN/m², as defined in [3.2.1].</p> <p>P_{BI} : Breaking wave impact pressure, in kN/m², as defined in [3.2.2].</p> <p>f_{FB-EI} : Longitudinal distribution factor <u>for entry impact</u> along the ship length, to be taken as follow but not to be taken greater than 1.0:</p> $f_{FB-EI} = 3.0 \left(f_{xL} + 2.5 \frac{L}{2500} - 0.2 \right) - 1.7 \quad \text{for } L \leq 200\text{m}$ $f_{FB-EI} = 3.0 f_{xL} - 1.7 \quad \text{for } L > 200\text{m}$ <p>f_{FB-BI} : Longitudinal distribution factor for breaking wave impact along the ship length, to be taken as:</p> $f_{FB-BI} = 15.7 - 15 f_{xL} \quad \text{but not less than 0.7 nor greater than 1.0}$ <p>C_{FB} : Vertical distribution factor, to be taken as:</p> $C_{FB} = \frac{z}{T_{SC}} - 0.15 \quad \text{but not less than 0.7 nor greater than 1.0}$	<p>- adjusted the distribution factor for the entry impact pressure</p> <p>- adjusted the distribution factor for the breaking wave impact pressure</p> <p>- newly added the vertical distribution factor for the break wave impact pressure</p>

Present	Amendment	Note
<p style="text-align: center;">Chapter 4 Loads</p> <p style="text-align: center;">Section 1 ~ 2 <omitted></p> <p style="text-align: center;">Section 3 Ship Motions and Accelerations</p> <p>1. <omitted></p> <p>2. Ship motions and accelerations</p> <p>2.1 <omitted></p> <p>2.2 Ship accelerations at the centre of gravity</p> <p>2.2.1 ~ 2.2.4 <omitted></p> <p>2.2.5 Pitch acceleration</p> <p>The pitch acceleration, a_{pitch} in rad/s^2, is to be taken as:</p> $a_{pitch} = f_p \left(\frac{3.1}{\sqrt{gL}} + 1.4 \right) \phi \frac{\pi}{180} \left(\frac{2\pi}{T_\phi} \right)^2$ <p>where:</p> <p>ϕ : Pitch angle using f_p equal to 1.0</p> <p>f_p : Coefficient to be taken as:</p> <p style="margin-left: 40px;">$f_p = f_{ps}$ for strength assessment.</p> <p style="margin-left: 40px;">$f_p = 1.0$ for fatigue assessment.</p> <p><omitted></p>	<p style="text-align: center;">Chapter 4 Loads</p> <p style="text-align: center;">Section 1 ~ 2 <same as present></p> <p style="text-align: center;">Section 3 Ship Motions and Accelerations</p> <p>1. <same as present></p> <p>2. Ship motions and accelerations</p> <p>2.1 <same as present></p> <p>2.2 Ship accelerations at the centre of gravity</p> <p>2.2.1 ~ 2.2.4 <same as present></p> <p>2.2.5 Pitch acceleration</p> <p>The pitch acceleration, a_{pitch} in rad/s^2, is to be taken as:</p> $a_{pitch} = f_p \left(\frac{3.1}{\sqrt{gL}} + 1.4 \right) \phi \frac{\pi}{180} \left(\frac{2\pi}{T_\phi} \right)^2$ <p>where:</p> <p>ϕ : Pitch angle using f_p equal to 1.0</p> <p>f_p : Coefficient to be taken as:</p> <p style="margin-left: 40px;">$f_p = f_{ps}$ for strength assessment.</p> <p style="margin-left: 40px;">$f_p = 0.92 \left[(0.36 - 0.1f_T) - (11.6 - 5.17f_T)L \times 10^{-9.34} \right]$ for fatigue assessment.</p> <p><same as present></p>	<p style="text-align: center;">-</p> <p style="text-align: center;">modified coefficient</p>

Present	Amendment	Note
<p style="text-align: center;">Chapter 12 Construction</p> <p style="text-align: center;">Section 1 ~ 2 <omitted></p> <p style="text-align: center;">Section 3 Design of Weld Joints</p> <p>1. <omitted></p> <p>2. Tee or Cross Joint</p> <p>2.1 ~ 2.2 <omitted></p> <p>2.3 Intermittent fillet welds</p> <p>3.2.1 <omitted></p> <p>3.2.2 Breaking wave impact pressure</p> <p>Where beams, stiffeners, frames, etc. are intermittently welded and pass through slotted girders, shelves or stringers, there is to be a pair of matched intermittent welds on each side of every intersection. In addition, the beams, stiffeners and frames are to be efficiently attached to the girders, shelves and stringers.</p> <p>Where intermittent welding or one side continuous welding is permitted, double continuous welds are to be applied for one-tenth of their shear span at each end; in accordance with [2.5.2] and [2.5.3].</p> <p><omitted></p>	<p style="text-align: center;">Chapter 12 Construction</p> <p style="text-align: center;">Section 1 ~ 2 <same as the present></p> <p style="text-align: center;">Section 3 Design of Weld Joints</p> <p>1. <same as the present></p> <p>2. Tee or Cross Joint</p> <p>2.1 ~ 2.2 <same as the present></p> <p>2.3 Intermittent fillet welds</p> <p>3.2.1 <same as the present></p> <p>3.2.2 Breaking wave impact pressure</p> <p>Where beams, stiffeners, frames, etc. are intermittently welded and pass through slotted girders, shelves or stringers, there is to be a pair of matched intermittent welds on each side of every intersection. In addition, the beams, stiffeners and frames are to be efficiently attached to the girders, shelves and stringers.</p> <p>Where intermittent welding or one side continuous welding is permitted, <u>unbracketed stiffeners of shell, watertight and oil-tight bulkheads, and deckhouse front ends are to have double continuous welds for one-tenth of their shear span at each end,</u> in accordance with [2.5.2] and [2.5.3]. <u>Unbracketed stiffeners of non-tight structural bulkheads, deckhouse sides and aft ends are to have a pair of matched intermittent welds at each end.</u></p> <p><same as the present></p>	<p>- revised the requirements for clarification</p>

Present	Amendment	Note
<p style="text-align: center;">Chapter 3 Structural Design Principles</p> <p style="text-align: center;">Section 1 ~ 2 <omitted> Section 3 Corrosion Additions</p> <p>1. General</p> <p>1.1 <omitted></p> <p>1.2 Corrosion addition determination</p> <p>1.2.1</p> <p>The corrosion addition for each of the two sides of a structural member, t_{c1} or t_{c2}, is specified in Table 1. <omitted></p>	<p style="text-align: center;">Chapter 3 Structural Design Principles</p> <p style="text-align: center;">Section 1 ~ 2 <same as the presnt> Section 3 Corrosion Additions</p> <p>1. General</p> <p>1.1 <same as the presnt></p> <p>1.2 Corrosion addition determination</p> <p>1.2.1</p> <p>The corrosion addition for each of the two sides of a structural member, t_{c1} or t_{c2}, is specified in Table 1. <same as the presnt></p>	

Present		Amendment	Note
Table 1 : Corrosion addition for one side of a structural member			
Compartment type		t_{c1} or t_{c2}	
Ballast water tank, bilge tank, drain storage tank, chain locker ⁽¹⁾		1.0	
Exposed to atmosphere ⁽⁵⁾		0.5	
Exposed to sea water ⁽⁵⁾		0.5	
Fuel oil and lube oil tank <u>Independent liquefied gas fuel tank</u>		0.5	
Membrane type liquefied gas fuel tank Independent liquefied gas fuel tank ⁽⁶⁾		0.0	
Fresh water tank		0.5	
Void spaces ⁽²⁾⁽³⁾⁽⁴⁾	Spaces not normally accessed, e.g. access only via bolted manhole openings, pipe tunnels, etc.	0.0	
Dry spaces ⁽³⁾⁽⁴⁾	Internals of machinery spaces, store rooms, steering gear space, etc.	0.0	
Container holds ⁽⁵⁾		0.5	
Accommodation spaces		0.0	
Compartments other than those mentioned above		0.5	
<p>⁽¹⁾ 1.0 mm is to be added to the plate surface within 3.0 m above the upper surface of the chain locker bottom.</p> <p>⁽²⁾ For the determination of the corrosion addition of the outer shell plating, the pipe tunnel is considered as for a ballast water tank.</p> <p>⁽³⁾ For bottom plate of void spaces and dry spaces, t_{c1} or t_{c2} is to be taken equal to 0.5 mm.</p> <p>⁽⁴⁾ For the hull girder strength assessment according to Ch 5, t_{c1} or t_{c2} is to be taken equal to 0.5 mm.</p> <p>⁽⁵⁾ For the hull girder strength assessment according to Ch 5, t_{c1} or t_{c2} is to be taken equal to 1.0 mm.</p> <p>⁽⁶⁾ Where both t_{c1} and t_{c2} are equal to 0.0, the total corrosion addition, t_c, is to be taken as 0.0.</p>			

Present	Amendment		Note
	Table 1 : Corrosion addition for one side of a structural member		- typo
	Compartment type	t_{c1} or t_{c2}	
	Ballast water tank, bilge tank, drain storage tank, chain locker ⁽¹⁾	1.0	
	Exposed to atmosphere ⁽⁵⁾	0.5	
	Exposed to sea water ⁽⁵⁾	0.5	
	Fuel oil and lube oil tank <u>Integral liquefied gas fuel tank</u>	0.5	
	Membrane type liquefied gas fuel tank Independent liquefied gas fuel tank ⁽⁶⁾	0.0	
	Fresh water tank	0.5	
	Void spaces ⁽²⁾⁽³⁾⁽⁴⁾ Spaces not normally accessed, e.g. access only via bolted manhole openings, pipe tunnels, etc.	0.0	
	Dry spaces ⁽³⁾⁽⁴⁾ Internals of machinery spaces, store rooms, steering gear space, etc.	0.0	
	Container holds ⁽⁵⁾	0.5	
	Accommodation spaces	0.0	
	Compartments other than those mentioned above	0.5	
<p>⁽¹⁾ 1.0 mm is to be added to the plate surface within 3.0 m above the upper surface of the chain locker bottom.</p> <p>⁽²⁾ For the determination of the corrosion addition of the outer shell plating, the pipe tunnel is considered as for a ballast water tank.</p> <p>⁽³⁾ For bottom plate of void spaces and dry spaces, t_{c1} or t_{c2} is to be taken equal to 0.5 mm.</p> <p>⁽⁴⁾ For the hull girder strength assessment according to Ch 5, t_{c1} or t_{c2} is to be taken equal to 0.5 mm.</p> <p>⁽⁵⁾ For the hull girder strength assessment according to Ch 5, t_{c1} or t_{c2} is to be taken equal to 1.0 mm.</p> <p>⁽⁶⁾ Where both t_{c1} and t_{c2} are equal to 0.0, the total corrosion addition, t_c, is to be taken as 0.0.</p>			

Present	Amendment	Note
<p style="text-align: center;">Chapter 4 Loads</p> <p style="text-align: center;">Section 1 ~ 5 <omitted></p> <p style="text-align: center;">Section 6 Internal Loads</p> <p>Symbols</p> <p>For symbols not defined in this section, refer to Ch 1, Sec 4. <omitted></p> <p>ρ_L : Density of liquid in the tank, in t/m³, but not less than:</p> <ul style="list-style-type: none"> • For fresh water $\rho_L=1.0$ • For liquefied natural gas as fuel $\rho_L=0.5$ for strength assessment $\rho_L=0.46$ or higher value for fatigue assessment • For methanol as fuel $\rho_L=0.8$ • For ammonia as fuel $\rho_L=0.8$ or higher value • For other cases $\rho_L=1.025$ <p><omitted></p>	<p style="text-align: center;">Chapter 4 Loads</p> <p style="text-align: center;">Section 1 ~ 5 <same as the present></p> <p style="text-align: center;">Section 6 Internal Loads</p> <p>Symbols</p> <p>For symbols not defined in this section, refer to Ch 1, Sec 4. <same as the present></p> <p>ρ_L : Density of liquid in the tank, in t/m³, but not less than:</p> <ul style="list-style-type: none"> • For fresh water $\rho_L=1.0$ • For liquefied natural gas as fuel $\rho_L=0.5$ for strength assessment $\rho_L=0.46$ or higher value for fatigue assessment • For methanol as fuel $\rho_L=0.8$ • For ammonia as fuel $\rho_L=0.68$ or higher value • For other cases $\rho_L=1.025$ <p><same as the present></p>	<p style="text-align: center;">- typo</p>

Present	Amendment	Note
<p style="text-align: center;">Chapter 4 Loads</p> <p style="text-align: center;">Section 1 ~ 4 <omitted> Section 5 External Loads</p> <p>1. ~ 2. <omitted></p> <p>3. External impact pressures</p> <p>3.1 <omitted></p> <p>3.2 Equivalent design pressure</p> <p>3.2.1 <omitted></p> <p>3.2.2 Breaking wave impact pressure</p> <p>The breaking wave impact pressure, P_{BI} in kN/m^2, is to be taken as: $P_{BI} = CP_B$ where: <omitted> P_B : Impact pressure, in kN/m^2. $P_B = \frac{1}{2} \rho K_B V_B^2 C_\beta$ <omitted> C_β : Coefficient, to be taken as: $C_\beta = 0.25 + \frac{\beta}{60}$ for $0^\circ < \beta \leq 45^\circ$ $C_\beta = 1$ for $45^\circ < \beta \leq 90^\circ$ C_ϕ : Hull inclination angle influence coefficient, in deg, to be taken as: $C_\phi = 1 - \frac{\alpha}{60}$ for $\beta < 15^\circ$ $C_\phi = 1$ for $\beta \geq 15^\circ$ <omitted></p>	<p style="text-align: center;">Chapter 4 Loads</p> <p style="text-align: center;">Section 1 ~ 4 <same as the present> Section 5 External Loads</p> <p>1. ~ 2. <same as the present></p> <p>3. External impact pressures</p> <p>3.1 <same as the present></p> <p>3.2 Equivalent design pressure</p> <p>3.2.1 <same as the present></p> <p>3.2.2 Breaking wave impact pressure</p> <p>The breaking wave impact pressure, P_{BI} in kN/m^2, is to be taken as: $P_{BI} = CP_B$ where: <same as the present> P_B : Impact pressure, in kN/m^2. $P_B = \frac{1}{2} \rho K_B V_B^2 C_\alpha$ <same as the present> C_β : Coefficient, to be taken as: $C_\beta = 0.8 + \frac{\beta}{450}$ C_α : Hull inclination angle influence coefficient, in deg, to be taken as: $C_\alpha = 1 + \frac{\alpha}{60}$ <same as the present></p>	<p>- adjusted the coefficient for considering the hull form promptly</p>

Present	Amendment	Note																
<p>3.3 Bottom slamming</p> <p>3.3.1 Design pressures</p> <p>The bottom slamming pressure, P_{SL} in kN/m², to be considered for the bottom slamming design load scenario is to be taken as:</p> $P_{SL} = 0.7 C_x P_{EI}$ <p>where: (newly added)</p> <p>C_x : Longitudinal distribution factor along the ship length, to be taken as:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">$C_x = 0.0$</td> <td>for $f_{xL} \leq 0.5$</td> </tr> <tr> <td>$C_x = 1.0$</td> <td>for $f_{xL} = 0.5 + c_1$</td> </tr> <tr> <td>$C_x = 1.0$</td> <td>for $f_{xL} = 0.6 + c_1$</td> </tr> <tr> <td>$C_x = 0.1$</td> <td>for $f_{xL} \geq 1.0$</td> </tr> </table> <p>Intermediate values of f_{SL} are obtained by linear interpolation.</p> <p>c_1 : Coefficient to be taken as:</p> $c_1 = 0.33C_B + \frac{L}{2500}$ but not greater than 0.35. (omitted)	$C_x = 0.0$	for $f_{xL} \leq 0.5$	$C_x = 1.0$	for $f_{xL} = 0.5 + c_1$	$C_x = 1.0$	for $f_{xL} = 0.6 + c_1$	$C_x = 0.1$	for $f_{xL} \geq 1.0$	<p>3.3 <same as present></p> <p>3.3.1 Design pressures</p> <p>The bottom slamming pressure, P_{SL} in kN/m², to be considered for the bottom slamming design load scenario is to be taken as:</p> $P_{SL} = 0.7 C_{SL} f_{SL} P_{EI}$ <p>where:</p> <p>C_{SL} : Slamming coefficient to be taken as:</p> $C_{SL} = 5.95 - 10.5 \left(\frac{T_F}{L} \right)^{0.2}$ but not to be taken greater than 1. <p>f_{SL} : Longitudinal distribution factor along the ship length, to be taken as:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">$f_{SL} = 0.0$</td> <td>for $f_{xL} \leq 0.5$</td> </tr> <tr> <td>$f_{SL} = 1.0$</td> <td>for $f_{xL} = 0.5 + c_1$</td> </tr> <tr> <td>$f_{SL} = 1.0$</td> <td>for $f_{xL} = 0.6 + c_1$</td> </tr> <tr> <td>$f_{SL} = 0.1$</td> <td>for $f_{xL} \geq 1.0$</td> </tr> </table> <p>Intermediate values of f_{SL} are obtained by linear interpolation.</p> <p>c_1 : Coefficient to be taken as:</p> $c_1 = 0.33C_B + \frac{L}{2500}$ but not greater than 0.35. (same as the present)	$f_{SL} = 0.0$	for $f_{xL} \leq 0.5$	$f_{SL} = 1.0$	for $f_{xL} = 0.5 + c_1$	$f_{SL} = 1.0$	for $f_{xL} = 0.6 + c_1$	$f_{SL} = 0.1$	for $f_{xL} \geq 1.0$	<p>- slamming coefficient is newly added</p>
$C_x = 0.0$	for $f_{xL} \leq 0.5$																	
$C_x = 1.0$	for $f_{xL} = 0.5 + c_1$																	
$C_x = 1.0$	for $f_{xL} = 0.6 + c_1$																	
$C_x = 0.1$	for $f_{xL} \geq 1.0$																	
$f_{SL} = 0.0$	for $f_{xL} \leq 0.5$																	
$f_{SL} = 1.0$	for $f_{xL} = 0.5 + c_1$																	
$f_{SL} = 1.0$	for $f_{xL} = 0.6 + c_1$																	
$f_{SL} = 0.1$	for $f_{xL} \geq 1.0$																	

Present	Amendment	Note
<p>3.4 Bow impact</p> <p>3.4.1 Design pressures</p> <p>The bow impact pressure, P_{FB} in kN/m^2, to be considered for the bow impact design load scenario is to be taken as:</p> $P_{FB} = \max(f_{FB-EI} P_{EI}, f_{FB-BI} C_{FB} P_{BI})$ <p>where:</p> <p>P_{EI} : Entry impact pressure, in kN/m^2, as defined in [3.2.1].</p> <p>P_{BI} : Breaking wave impact pressure, in kN/m^2, as defined in [3.2.2].</p> <p>f_{FB-EI} : Longitudinal distribution factor for entry impact along the ship length, to be taken as follow but not to be taken greater than 1.0:</p> $f_{FB-EI} = 3.0 \left(f_{xL} + 2.5 \frac{L}{2500} - 0.2 \right) - 1.7 \quad \text{for } L \leq 200 \text{ m}$ $f_{FB-EI} = 3.0 f_{xL} - 1.7 \quad \text{for } L > 200 \text{ m}$ <p>f_{FB-BI} : Longitudinal distribution factor for breaking wave impact along the ship length, to be taken as:</p> <p>$f_{FB-BI} = 15.7 - 15 f_{xL}$ but not less than 0.7 or greater than 1.0</p> <p>C_{FB} : Vertical distribution factor, to be taken as:</p> <p>$C_{FB} = \frac{z}{T_{SC}} - 0.15$ but not less than 0.7 or greater than 1.0</p>	<p>3.4 Bow impact</p> <p>3.4.1 Design pressures</p> <p>The bow impact pressure, P_{FB} in kN/m^2, to be considered for the bow impact design load scenario is to be taken as:</p> $P_{FB} = \max(f_{FB-EI} P_{EI}, P_{BI})$ <p>where:</p> <p>P_{EI} : Entry impact pressure, in kN/m^2, as defined in [3.2.1].</p> <p>P_{BI} : Breaking wave impact pressure, in kN/m^2, as defined in [3.2.2].</p> <p>f_{FB-EI} : Longitudinal distribution factor along the ship length, to be taken as follow but not to be taken greater than 1.0:</p> $f_{FB-EI} = 3.0 \left(f_{xL} + 2.5 \frac{L}{2500} - 0.2 \right) - 1.7 \quad \text{for } L \leq 200 \text{ m}$ $f_{FB-EI} = 3.0 f_{xL} - 1.7 \quad \text{for } L > 200 \text{ m}$	<p>- modified the formula due to revision of the breaking wave impact pressure</p>

PART 15

Present	Amendment	Note
<p style="text-align: center;">〈RULE PART 15〉</p> <p style="text-align: center;">Chapter 12 Construction</p> <p style="text-align: center;">Section 3 Design of Weld Joints</p> <p>1. Application 〈omitted〉</p> <p>2. Tee or Cross Joint</p> <p>2.1 ~ 2.2 〈omitted〉</p> <p>2.3 Intermittent fillet welds</p> <p>2.3.1</p> <p>Where continuous welding is not required, intermittent welding may be applied.</p> <p>2.3.2</p> <p>Where beams, stiffeners, frames, etc, are intermittently welded and pass through slotted girders, shelves or stringers, there is to be a pair of matched intermittent welds on each side of every intersection. In addition, the beams, stiffeners and frames are to be efficiently attached to the girders, shelves and stringers.</p> <p>Where intermittent welding or one side continuous welding is permitted, double continuous welds are to be applied for one-tenth of their shear span at each end, in accordance with [2.5.2] and [2.5.3].</p> <p>〈omitted〉</p>	<p style="text-align: center;">〈RULE PART 15〉</p> <p style="text-align: center;">Chapter 12 Construction</p> <p style="text-align: center;">Section 3 Design of Weld Joints</p> <p>1. Application 〈same as the present〉</p> <p>2. Tee or Cross Joint</p> <p>2.1 ~ 2.2 〈same as the present〉</p> <p>2.3 Intermittent fillet welds</p> <p>2.3.1</p> <p>Where continuous welding is not required, intermittent welding may be applied.</p> <p>2.3.2</p> <p>Where beams, stiffeners, frames, etc, are intermittently welded and pass through slotted girders, shelves or stringers, there is to be a pair of matched intermittent welds on each side of every intersection. In addition, the beams, stiffeners and frames are to be efficiently attached to the girders, shelves and stringers.</p> <p>Where intermittent welding or one side continuous welding is permitted, <u>unbracketed stiffeners of shell, watertight and oil-tight bulkheads, and deckhouse front ends are to have double continuous welds for one-tenth of their shear span at each end, double continuous welds are to be applied for their shear span at each end,</u> in accordance with [2.5.2] and [2.5.3]. <u>Unbracketed stiffeners of non-tight structural bulkheads, deckhouse sides and aft ends are to have a pair of matched intermittent welds at each end.</u></p> <p>〈same as the present〉</p>	<p>– revised the requirements for clarification</p>

Present	Amendment	Note
<p style="text-align: center;">〈Rule Part 15〉</p> <p style="text-align: center;">Chapter 8 Buckling</p> <p style="text-align: center;">Section 5 Buckling capacity</p> <p>1. General 〈omitted〉</p> <p>2. Buckling capacity of plates and stiffeners</p> <p>2.1 ~ 2.2 〈omitted〉</p> <p>2.3 tiffeners</p> <p>2.3.1 Buckling modes 〈omitted〉</p>	<p style="text-align: center;">〈Rule Part 15〉</p> <p style="text-align: center;">Chapter 8 Buckling</p> <p style="text-align: center;">Section 5 Buckling capacity</p> <p>1. General 〈same as the present〉</p> <p>2. Buckling capacity of plates and stiffeners</p> <p>2.1 ~ 2.2 〈same as the present〉</p> <p>2.3 Stiffeners</p> <p>2.3.1 Buckling modes 〈same as the present〉</p>	<p>– Revised the typo</p>



Present	Amendment	Note
<p style="text-align: center;">Chapter 9 Fatigue Section 3 Fatigue Evaluation</p> <p>1. Fatigue Analysis Methodology <omitted></p> <p>2. Acceptance Criteria <omitted></p> <p>3. Reference Stresses for Fatigue Assessment</p> <p>3.1 ~ 3.2 <omitted></p> <p>3.3 Thickness effect</p> <p>3.3.1</p> <p>Plate thickness primarily influences the fatigue strength of welded joints through the effect of geometry, and through-thickness stress distribution. The correction factor, f_{thick}, for plate thickness effect is taken as:</p> <p><omitted></p> <p>When post-weld treatment methods are applied to improve the fatigue life of considered welded joint, the thickness exponent is provided in [6].</p> <p><omitted></p> <p>4. S-N Curves</p> <p>4.1 Basic S-N curves</p> <p>4.1.1 ~ 4.1.3</p> <p>4.1.4 In-air environment</p> <p>The basic design curves in-air environment shown in Figure 2 are represented by linear relationships between $\log(\Delta\sigma)$ and $\log(N)$ as follows:</p> $\log(N) = \log(K_2) - m \cdot \log(\Delta\sigma)$	<p style="text-align: center;">Chapter 9 Fatigue Section 3 Fatigue Evaluation</p> <p>1. Fatigue Analysis Methodology <same as the present></p> <p>2. Acceptance Criteria <same as the present></p> <p>3. Reference Stresses for Fatigue Assessment</p> <p>3.1 ~ 3.2 <same as the present></p> <p>3.3 Thickness effect</p> <p>3.3.1</p> <p>Plate thickness primarily influences the fatigue strength of welded joints through the effect of geometry, and through-thickness stress distribution. The correction factor, f_{thick}, for plate thickness effect is taken as:</p> <p><same as the present></p> <p>When post-weld treatment methods are applied to improve the fatigue life of considered welded joint, the thickness exponent is provided in [6].</p> <p><same as the present></p> <p>4. S-N Curves</p> <p>4.1 Basic S-N curves</p> <p>4.1.1 ~ 4.1.3</p> <p>4.1.4 In-air environment</p> <p>The basic design curves in-air environment shown in Figure 2 are represented by linear relationships between $\log(\Delta\sigma)$ and $\log(N)$ as follows:</p> $\log(N) = \log(K_2) - m \cdot \log(\Delta\sigma)$	<p>- As the thickness exponent for post-weld treatment methods is already stated in Ch 9, Sec 3, [4], Table 1, instead of Ch 9, Sec 3, [6], the deleted paragraph is considered unnecessary.</p> <p>-</p>

Present	Amendment	Note																																																																												
<p>where:</p> $\log(K_2) = \log(K_1) - 2\log(\delta).$ <p>K_1 : Constant related to mean S-N curve, as given in Table 2. K_2 : Constant related to design S-N curve, as given in Table 2. δ : Standard deviation of log (N), as given in Table 2. $\Delta\sigma_q$: Stress range at $N = 10^7$ cycles related to design S-N curve, in N/mm^2, as given in Table 2.</p>	<p>where:</p> $\log(K_2) = \log(K_1) - 2\delta.$ <p>K_1 : Constant related to mean S-N curve, as given in Table 2. K_2 : Constant related to design S-N curve, as given in Table 2. δ : Standard deviation of log (N), as given in Table 2. $\Delta\sigma_q$: Stress range at $N = 10^7$ cycles related to design S-N curve, in N/mm^2, as given in Table 2.</p>	<p>- According to the definition of δ, the formula for $\log(K_2)$ and duplicated description of δ and K_2 in Table 2 are updated.</p>																																																																												
<p align="center">Table 2 : Basic S-N curve data, in-air environment</p>	<p align="center">Table 2 : Basic S-N curve data, in-air environment</p>																																																																													
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<p>4.1.5 Corrosive environment</p> <p>The basic design curves for corrosive environment shown in Figure 3 are represented by linear relationships between $\log(\Delta\sigma)$ and $\log(N)$ as follows:</p> $\log(N) = \log(K_2) - m \log(\Delta\sigma)$ <p>where:</p> <p>N : Predicted number of cycles to failure under stress range $\Delta\sigma$. K_2 : Constant related to design S-N curve as given in Table 3.</p>	<p>4.1.5 Corrosive environment</p> <p>The basic design curves for corrosive environment shown in Figure 3 are represented by linear relationships between $\log(\Delta\sigma)$ and $\log(N)$ as follows:</p> $\log(N) = \log(K_2) - m \log(\Delta\sigma)$ <p>where:</p> <p>N : Predicted number of cycles to failure under stress range $\Delta\sigma$. K_2 : Constant related to design S-N curve as given in Table 3.</p>																																																																													

Present

Table 3 : Basic S-N curve data, corrosive environment

Class	K_2	m	Design stress range at 2×10^6 cycles, N/mm^2
B_{corr}	5.05×10^{14}	4.0	126.1
C_{corr}	2.12×10^{13}	3.5	101.6
D_{corr}	7.60×10^{11}	3.0	72.4

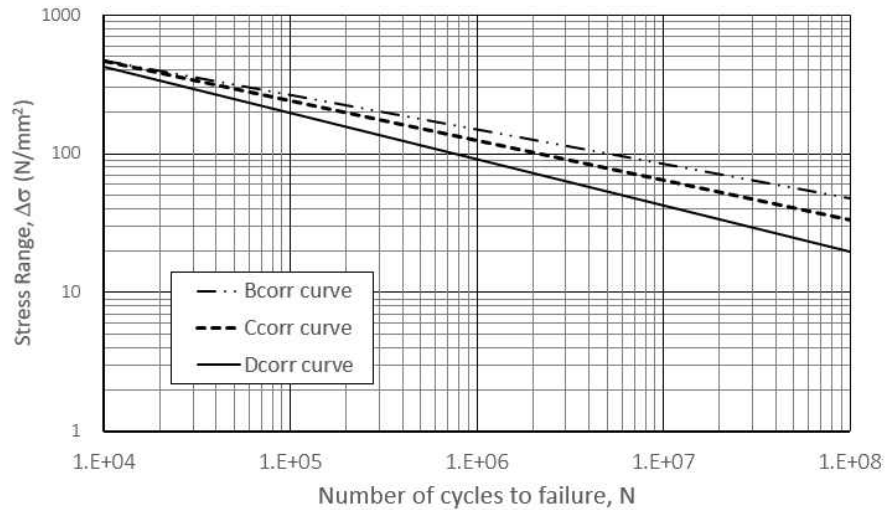


Figure 3 : Basic design S-N curves, corrosive environment

<omitted>

4.2 Selection of S-N curves <omitted>

Amendment

Table 3 : Basic S-N curve data, corrosive environment

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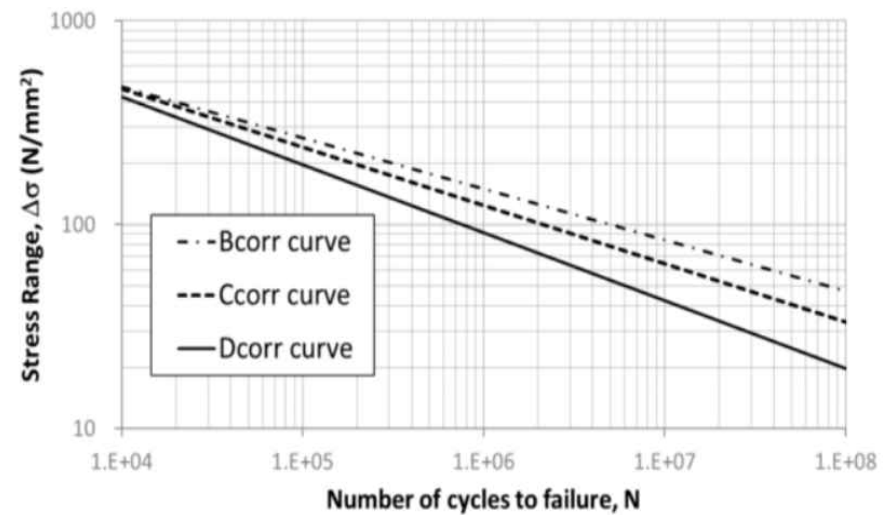


Figure 3 : Basic design S-N curves, corrosive environment

<same as the present>

4.2 Selection of S-N curves <same as the present>

Note

- Figure 3 is updated in accordance with Table 3.

Present	Amendment	Note
<p>5. Fatigue Damage Calculation</p> <p>5.1 General <omitted></p> <p>5.2 Elementary fatigue damage</p> <p>5.2.1</p> <p>The elementary fatigue damage for each fatigue loading condition (j) is to be calculated independently for both protected in-air environment and unprotected corrosive environment, based on the fatigue stress range obtained for the predominant load case as follows:</p> $D_{E(j)} = \frac{\alpha_{(j)} \cdot N_D}{K_2} \frac{\Delta \sigma_{FS,(j)}^m}{(\ln N_R)^{m/\xi}} \cdot \mu_{(j)} \cdot \Gamma\left(1 + \frac{m}{\xi}\right)$ <p>where:</p> <p>N_D : Total number of wave cycles experienced by ship during the design fatigue life, taken as:</p> $N_D = 31.557 \times 10^6 (f_0 T_{DF}) / (4 \log L)$ <p><omitted></p>	<p>5. Fatigue Damage Calculation</p> <p>5.1 General <same as the present></p> <p>5.2 Elementary fatigue damage</p> <p>5.2.1</p> <p>The elementary fatigue damage for each fatigue loading condition (j) is to be calculated independently for both protected in-air environment and unprotected corrosive environment, based on the fatigue stress range obtained for the predominant load case as follows:</p> $D_{E(j)} = \frac{\alpha_{(j)} \cdot N_D}{K_2} \frac{\Delta \sigma_{FS,(j)}^m}{(\ln N_R)^{m/\xi}} \cdot \mu_{(j)} \cdot \Gamma\left(1 + \frac{m}{\xi}\right)$ <p>where:</p> <p>N_D : Total number of wave stress cycles due to wave loads experienced by ship assumed during the design fatigue life, taken as:</p> $N_D = 31.557 \times 10^6 (f_0 T_{DF}) / (4 \log L)$ <p><same as the present></p>	<ul style="list-style-type: none"> - Number of wave cycles is a value dependent on length of vessel assumed the vessel will experience. - The current fatigue assessment is based on S-N curves, which is the number of cycles to failure under a specific stress range. So N_D represents the total number of stress cycles due to wave loads assumed during the design fatigue life. Definition of N_D is updated to clarify this.

Present	Amendment	Note
<p style="text-align: center;">Section 4 Simplified Stress Analysis</p> <p>1.~3. <omitted></p> <p>4. Local Stiffener Stress</p> <p>4.1 Stress due to stiffener bending</p> <p>4.1.1 Stress due to dynamic pressure <omitted></p> <p>4.1.2 Stress due to static pressure</p> <p>The hot spot stress due to local static pressure, in N/mm², for loading condition (<i>j</i>) is obtained from the following formula:</p> $\sigma_{LS,(j)} = \frac{K_b K_n s \ell_{bdg}^2 (\eta_s P_{S,(j)} + \eta_{ls} P_{ls,(j)}) \left(1 - \frac{6x_e}{\ell_{bdg}} + \frac{6x_e^2}{\ell_{bdg}^2}\right)}{12 Z_{eff-n50}}$ <p>where:</p> <p>$P_{S,(j)}$: Static external pressure, in kN/m², in loading condition (<i>j</i>) specified in Ch 4, Sec 5, [1.2].</p> <p>$P_{ls,(j)}$: Static liquid tank pressure, in kN/m², in loading condition (<i>j</i>) specified in Ch 4, Sec 6, [1.2].</p> <p>Pressure acting on both sides could be simultaneously considered if relevant in the loading condition.</p> <p>η_s, η_{ls} : Pressure normal coefficients, taken as:</p> <p>$\eta = 1$ when the considered pressure is applied on the stiffener side, $\eta = -1$ otherwise.</p> <p><omitted></p>	<p style="text-align: center;">Section 4 Simplified Stress Analysis</p> <p>1.~3. <same as the present></p> <p>4. Local Stiffener Stress</p> <p>4.1 Stress due to stiffener bending</p> <p>4.1.1 Stress due to dynamic pressure <same as the present></p> <p>4.1.2 Stress due to static pressure</p> <p>The hot spot stress due to local static pressure, in N/mm², for loading condition (<i>j</i>) is obtained from the following formula:</p> $\sigma_{LS,(j)} = \frac{K_b K_n s \ell_{bdg}^2 (\eta_s P_{S,(j)} + \eta_{ls} P_{ls,(j)}) \left(1 - \frac{6x_e}{\ell_{bdg}} + \frac{6x_e^2}{\ell_{bdg}^2}\right)}{12 Z_{eff-n50}}$ <p>where:</p> <p>$P_{S,(j)}$: Static external pressure, in kN/m², in loading condition (<i>j</i>) specified in Ch 4, Sec 5, [1.2].</p> <p>$P_{ls,(j)}$: Static liquid tank pressure, in kN/m², in loading condition (<i>j</i>) specified in Ch 4, Sec 6, [1.2].</p> <p>Pressure acting on both sides could be simultaneously considered if relevant in the loading condition. For the deck longitudinal stiffeners of bulk carriers, no internal pressure from the topside tank is considered.</p> <p>η_s, η_{ls} : Pressure normal coefficients, taken as:</p> <p>$\eta = 1$ when the considered pressure is applied on the stiffener side, $\eta = -1$ otherwise.</p> <p><same as the present></p>	<p>- $P_{ls,(j)}$</p> <p>- The definition of $P_{ls,(j)}$ is updated to clarify no internal pressure from the topside tank is considered for the deck longitudinal stiffeners of bulk carriers, same with the application of dynamic liquid tank pressure $P_{ld,ik(j)}$ as defined in Ch 9, Sec 4, [4.1.1].</p>

Present	Amendment	Note
<p style="text-align: center;">Section 5 Finite Element Stress Analysis</p> <p>1.~2. <omitted></p> <p>3. Hot Spot Stress for Details Different from Web-Stiffened Cruciform Joints</p> <p>3.1 Welded details</p> <p>3.1.1</p> <p>For hot spot type 'a', the structural hot spot stress, σ_{HS}, is calculated from a finite element analysis with $t_{gr} \times t_{gr}$ mesh density and is obtained by the following formula:</p> $\sigma_{HS} = 1.12 \cdot \sigma$ <p>where:</p> <p>σ : Surface principal stress, in N/mm², read out at a distance $t_{gr}/2$ away from the intersection line.</p> <p>t_{gr} : Plate gross thickness, in mm, in way of the weld toe.</p> <p>At structural details where the hot spot type 'a' is classified as a web-stiffened cruciform joint, the stress read out procedure of [4.2] is to be applied.</p> <p>For hot spot type 'b', the stress distribution is not dependent on the plate thickness; the structural hot spot stress, σ_{HS}, is derived from a finite element analysis with mesh density 10×10mm and is obtained by the following formula:</p> $\sigma_{HS} = 1.12 \cdot \sigma$ <p>where:</p> <p>σ : Surface principal stress, in N/mm², read out at an absolute distance from the intersection line of 5 mm.</p> <p><omitted></p>	<p style="text-align: center;">Section 5 Finite Element Stress Analysis</p> <p>1.~2. <same as the present></p> <p>3. Hot Spot Stress for Details Different from Web-Stiffened Cruciform Joints</p> <p>3.1 Welded details</p> <p>3.1.1</p> <p>For hot spot type 'a', the structural hot spot stress, σ_{HS}, is calculated from a finite element analysis with $t_{gr} \times t_{gr}$ mesh density and is obtained by the following formula:</p> $\sigma_{HS} = 1.12 \cdot \sigma$ <p>where:</p> <p>σ : Surface principal stress, in N/mm², read out at a distance $t_{gr}/2$ away from the intersection line.</p> <p>t_{gr} : Plate gross thickness, in mm, in way of the weld toe.</p> <p>At structural details where the hot spot type 'a' is classified as a web-stiffened cruciform joint, the stress read out procedure of [4.2] is to be applied.</p> <p>For hot spot type 'b', the stress distribution is not dependent on the plate thickness; the structural hot spot stress, σ_{HS}, is derived from a finite element analysis with mesh density 10×10mm and is obtained by the following formula:</p> $\sigma_{HS} = 1.12 \cdot \sigma$ <p>where:</p> <p>σ : Surface principal stress Beam element stress, in N/mm², read out at an absolute a distance of 5mm from the intersection line of 5 mm.</p> <p><same as the present></p>	<p>– The rule text is rephrased to clarify that for hot spot type 'b', the read out point is at a distance of 5 mm from the intersection line.</p>

Present	Amendment	Note
<p style="text-align: center;">Section 6 Detail Design Standard</p> <p>1.~3. <omitted></p> <p>4. Hopper knuckle connection</p> <p>4.1 Design standard C to E</p> <p>4.1.1~4.1.3 <omitted></p> <p>4.1.4</p> <p>In general, the prescribed minimum requirements for welding, weld dressing and building tolerances as given in Table 3 to Table 5 are to be followed. Alternative positioning and/or dispensation of some support structure, such as transverse and longitudinal brackets may be accepted subject to demonstration of acceptable fatigue lives. Inserts and/or weld dressing additional to those prescribed may be required as a consequence of hot spot fatigue analysis.</p>	<p style="text-align: center;">Section 6 Detail Design Standard</p> <p>1.~3. <same as the present></p> <p>4. Hopper knuckle connection</p> <p>4.1 Design standard C to E</p> <p>4.1.1~4.1.3 <same as the present></p> <p>4.1.4</p> <p>In general, the prescribed minimum requirements for welding, weld dressing and building tolerances as given in Table 3 to Table 5 are to be followed. Alternative positioning and/or dispensation of some support structure, such as transverse and longitudinal brackets may be accepted subject to demonstration of acceptable fatigue lives. Inserts and/or weld dressing additional to those prescribed may be required as a consequence of hot spot fatigue analysis.</p>	<p>– The figure is updated to clarify the butt weld of deck stiffener should keep clear of the block joints with a distance not less than 30mm for option I.</p>

Table 2 : Design standard B - scallops in way of block joints

Welding of deck stiffeners in way of block joints

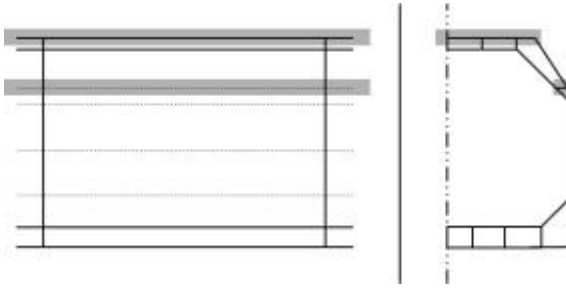
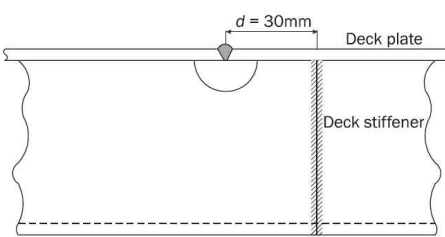
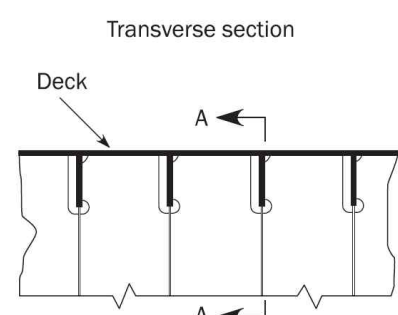
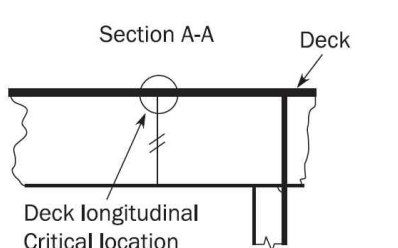
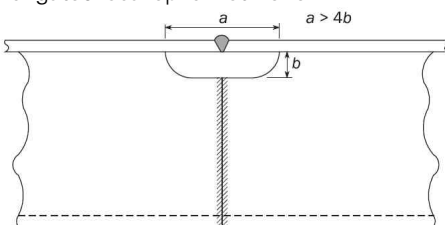
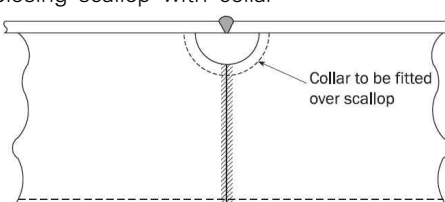
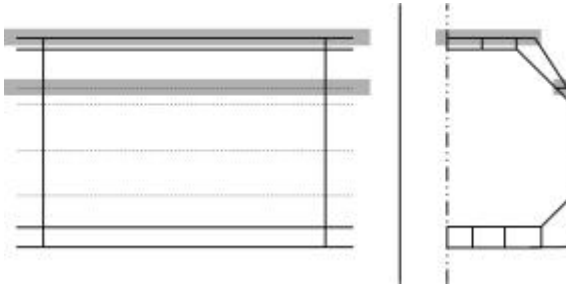
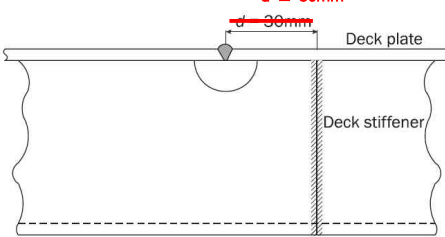
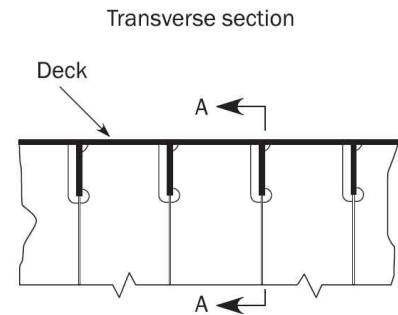
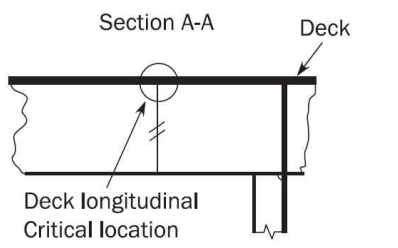
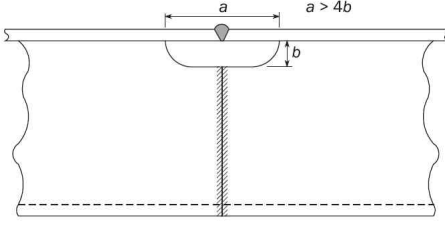
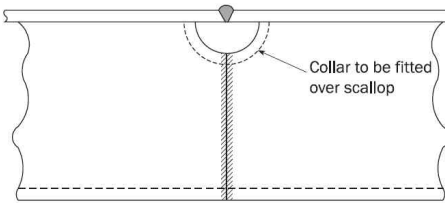
Critical areas	Design standard B
	<p>(1) Offset butt on stiffener</p> 
<p>Critical locations</p> <p>Transverse section</p>  <p>Deck</p> <p>A ←</p> <p>Section A-A</p>  <p>Deck longitudinal Critical location</p> <p>Deck</p>	<p>(2) Elongated scallop on stiffener</p>  <p>(3) Closing scallop with collar</p>  <p>Collar to be fitted over scallop</p> <p>Note 1: Alternative scallop geometry to that shown in option 2 may be accepted subject to demonstration of satisfactory fatigue life based on hull girder loads taking into account additional stress concentration factor in way of weld.</p>
Critical location	Welding of deck stiffeners in way of block joints in cargo tank region, the strength deck and side above 0.9 D from the baseline.
Detail design standard	All scallops are to be fitted according to detail design standard B.
Building tolerances	Ensure alignment of all structural members according to IACS Recommendation No. 47.
Welding requirements	Full penetration butt weld, free of undercut or notches, around the web and flange of the longitudinal stiffener at block joints, particularly in way of the weld termination at the scallop for option 2.

Table 2 : Design standard B - scallops in way of block joints

Welding of deck stiffeners in way of block joints

Critical areas	Design standard B
	<p>(1) Offset butt on stiffener $d \geq 30\text{mm}$</p> 
Critical locations	Design standard B
<p>Transverse section</p>  <p>Section A-A</p>  <p>Deck longitudinal Critical location</p>	<p>(2) Elongated scallop on stiffener</p>  <p>(3) Closing scallop with collar</p>  <p>Note 1: Alternative scallop geometry to that shown in option 2 may be accepted subject to demonstration of satisfactory fatigue life based on hull girder loads taking into account additional stress concentration factor in way of weld.</p>
Critical location	Welding of deck stiffeners in way of block joints in cargo tank region, the strength deck and side above 0.9 D from the baseline.
Detail design standard	All scallops are to be fitted according to detail design standard B.
Building tolerances	Ensure alignment of all structural members according to IACS Recommendation No. 47.
Welding requirements	Full penetration butt weld, free of undercut or notches, around the web and flange of the longitudinal stiffener at block joints, particularly in way of the weld termination at the scallop for option 2.

OTHER RULES AND GUIDANCE

Present	Amendment	Note
<p style="text-align: center; color: blue;">〈Rules for the Classification of Ships Using Low-flashpoint Fuels〉</p> <p style="text-align: center;">CHAPTER 11 FIRE SAFETY</p> <p style="text-align: center;">Section 3 Fire Protection</p> <p>301. Fire protection</p> <ol style="list-style-type: none"> 1. In applying 301. 1 of this Rules, fire protection means structural fire protection, not including <u>means</u> of escape. 2. Notwithstanding paragraph <u>1</u>, any enclosed spaces containing equipment for fuel preparation such as <u>pumps or compressors or other potential ignition sources</u> are to comply with Ch 11 Sec 8 of Rules (2024) 3. In applying 301. 3 of this Rules, the following “other rooms with high fire risk” is to be as a minimum be considered, but not be restricted to: <ol style="list-style-type: none"> (1) <u>Cargo spaces</u> except: <ol style="list-style-type: none"> (A) cargo tanks for liquids with <u>FP</u> above 60 °C (B) the carriage of ore, coal, grain, unseasoned timber, non-combustible cargoes or cargoes which, in the opinion of the Society, constitute a low fire risk complying with Pt 8, Ch 8, 601. 4 of Rules for the classification of steel ships. (2) <u>Vehicle, Ro-Ro</u> and special category spaces (3) <u>Service spaces (high risk): Galleys</u>, pantries containing cooking appliances, saunas, paint lockers and store-rooms having areas of 4 m² or more, spaces for the storage of flammable liquids and workshops other than those forming part of the machinery space. (4) “<u>Accommodation spaces of greater fire risk for ships carrying more than 36 passengers: saunas, sale shops, barber shops and beauty parlours and public spaces containing furniture and furnishings of other than restricted fire risk and having a deck area of 50 m² or more.</u>” 	<p style="text-align: center; color: blue;">〈Rules for the Classification of Ships Using Low-flashpoint Fuels〉</p> <p style="text-align: center;">CHAPTER 11 FIRE SAFETY</p> <p style="text-align: center;">Section 3 Fire Protection</p> <p>301. Fire protection</p> <ol style="list-style-type: none"> 1. In applying 301. 1 of this Rules, fire protection means structural fire protection, not including <u>means</u> of escape. 2. Notwithstanding paragraph <u>1</u>, any enclosed spaces containing equipment for fuel preparation such as <u>pumps, compressors or other potential ignition sources</u> are to comply with Ch 11, Sec 8 of this Rules. (2024) 3. In applying 301. 3 of this Rules, the following “other rooms with high fire risk” is to be as a minimum be considered, but not be restricted to: <ol style="list-style-type: none"> (1) <u>cargo spaces</u> except: <ol style="list-style-type: none"> (A) cargo tanks for liquids with <u>flashpoint</u> above 60 °C; <u>and</u> (B) the carriage of ore, coal, grain, unseasoned timber, non-combustible cargoes or cargoes which, in the opinion of the Society, constitute a low fire risk complying with Pt 8, Ch 8, 601. 4 of Rules for the classification of steel ships. (2) <u>vehicle, ro-ro</u> and special category spaces (3) <u>service spaces (high risk): galleys</u>, pantries containing cooking appliances, saunas, paint lockers and store-rooms having areas of 4 m² or more, spaces for the storage of flammable liquids and workshops other than those forming part of the machinery space; <u>and</u> (4) <u>accommodation spaces of greater fire risk for ships carrying more than 36 passengers: saunas, sale shops, barber shops and beauty parlours and public spaces containing furniture and furnishings of other than restricted fire risk and having a deck area of 50 m² or more.</u> 	<p>corregenda</p> <p>corregenda (ACS UI GF13(Rev.1))</p> <p>corregenda (MSC.1/Circ.1591)</p>

Present	Amendment	Note
<p data-bbox="125 252 947 284">〈Rules for the classification of Mobile Offshore Units〉</p> <p data-bbox="203 347 860 387">CHAPTER 4 DESIGN CONDITION</p> <p data-bbox="286 443 786 480">Section 2 Calculation of Strength</p> <p data-bbox="91 531 387 560">201. Structural analysis</p> <p data-bbox="125 576 981 667">The unit is to be analysed by the method deemed appropriate by the Society for a sufficient number of conditions including all conditions specified in Ch 1, 107. ↓</p>	<p data-bbox="1037 252 1859 284">〈Rules for the classification of Mobile Offshore Units〉</p> <p data-bbox="1115 347 1771 387">CHAPTER 4 DESIGN CONDITION</p> <p data-bbox="1198 480 1697 517">Section 2 Calculation of Strength</p> <p data-bbox="1003 563 1299 592">201. Structural analysis</p> <p data-bbox="1037 608 1890 699">The unit is to be analysed by the method deemed appropriate by the Society for a sufficient number of conditions including all conditions specified in Ch 1, 207. ↓ ↓</p>	<p data-bbox="1912 459 2107 480">– Error processing.</p>

Present	Amendment	Note
<p data-bbox="306 288 768 352" style="text-align: center;">〈Rules for the classification of Mobile Offshore Drilling Units〉</p> <p data-bbox="129 416 943 488" style="text-align: center;">CHAPTER 3 CONSTRUCTION, STRENGTH AND MATERIALS</p> <p data-bbox="286 517 786 549" style="text-align: center;">Section 4 Calculation of Strength</p> <p data-bbox="91 601 387 628">401. Structural analysis</p> <p data-bbox="129 649 981 738">The unit is to be analysed by the method deemed appropriate by the Society for a sufficient number of conditions including all conditions specified in Ch 1, 107. ↓</p>	<p data-bbox="1216 288 1677 352" style="text-align: center;">〈Rules for the classification of Mobile Offshore Drilling Units〉</p> <p data-bbox="1039 416 1852 488" style="text-align: center;">CHAPTER 3 CONSTRUCTION, STRENGTH AND MATERIALS</p> <p data-bbox="1198 517 1697 549" style="text-align: center;">Section 4 Calculation of Strength</p> <p data-bbox="1003 601 1299 628">401. Structural analysis</p> <p data-bbox="1041 649 1890 738">The unit is to be analysed by the method deemed appropriate by the Society for a sufficient number of conditions including all conditions specified in Ch 1, 207. ↓</p>	<p data-bbox="1917 496 2107 517" style="text-align: center;">– Error processing.</p>

Present	Amendment	Note
<p data-bbox="181 204 896 295"> 〈Rules for the Classification of Ships Using Low-flashpoint Fuels〉 CHAPTER 3. GENERAL REQUIREMENTS Section 2 Risk Assessment </p> <p data-bbox="91 547 376 571">201. Risk assessment</p> <p data-bbox="120 595 981 691"> 2. For ships using natural gas as fuel, the risk assessment required by 1 need only be conducted where explicitly required by the followings: (3) 301. 1 of Ch 8; </p>	<p data-bbox="1093 204 1803 295"> 〈Rules for the Classification of Ships Using Low-flashpoint Fuels〉 CHAPTER 3. GENERAL REQUIREMENTS Section 2 Risk Assessment </p> <p data-bbox="1003 547 1288 571">201. Risk assessment</p> <p data-bbox="1032 595 1892 691"> 2. For ships using natural gas as fuel, the risk assessment required by 1 need only be conducted where explicitly required by the followings: (3) 301. 1 of Ch 8 </p>	<p data-bbox="1912 520 2011 544">corregenda</p>

Amendment	Note
<p style="text-align: center; color: blue;">Guidance Relating to the Rules for the Classification of Ships Using Low-flashpoint Fuels</p> <p style="text-align: center;">Annex 5 Requirements for Ships Using Methyl/Ethyl Alcohol as Fuel (2021)</p> <p style="text-align: center;">Section 6 Fuel Containment System</p> <p>605. Inert gas availability on board</p> <ol style="list-style-type: none"> 1. Inert gas should be available permanently on board in order to achieve at least one trip from port to port considering maximum consumption of fuel expected and maximum length of trip expected and to keep tanks inerted during two weeks in harbour with minimum port consumption. 2. A production plant and/or adequate storage capacities might be used to achieve availability target defined in 1. 3. Fluid used for inerting should not modify the characteristics of the fuel. 4. The production plant, if fitted, should be capable of producing inert gas with oxygen content at no time greater than 5% by volume. A continuous-reading oxygen content meter should be fitted to the inert gas supply from the equipment and should be fitted with an alarm set at a maximum of 5% oxygen content by volume. The system should be designed to ensure that if the oxygen content exceeds 5% by volume, the inert gas should be automatically vented+ to atmosphere. 5. The system should be able to maintain an atmosphere with an oxygen content not exceeding 8% by volume in any part of any fuel tank. 6. An inert gas system should have pressure controls and monitoring arrangements appropriate to the fuel containment system. 7. Where a nitrogen generator or nitrogen storage facilities are installed in a separate compartment outside of the engine-room, the separate compartment should be fitted with an independent mechanical extraction ventilation system, providing a minimum of six air changes per hour. If the oxygen content is below 19% in the separate compartment, an alarm should be given. A minimum of two oxygen sensors should be provided in each space. Visual and audible alarms should be placed at each entrance to the inert gas room. 8. Nitrogen pipes should only be led through well ventilated spaces. Nitrogen pipes in enclosed spaces should: <ol style="list-style-type: none"> (1) have only a minimum of flange connections as needed for fitting of valves and be fully welded; and (2) be as short as possible. 9. Notwithstanding the provisions of 303.605., inert gas utilized for gas-freeing of tanks may be provided externally to the ship. 	<p>- Editorial error corrected.</p>

Present	Amendment	Note
<p style="text-align: center;">CHAPTER 6 FUEL CONTAINMENT SYSTEM</p> <p style="text-align: center;">Section 7 Pressure Relief System</p> <p>703. Sizing of pressure relieving system</p> <p>1. Sizing of pressure relief valves</p> <p>(1) PRVs are to have a combined relieving capacity for each liquefied gas fuel tank to discharge the greater of the following, with not more than a 20% rise in liquefied gas fuel tank pressure above the MARVS:</p> <p>(B) vapors generated under fire exposure computed using the following formula: 【See Guidance】</p> $Q = FGA^{0.82} \quad (\text{m}^3/\text{s})$ <p>where:</p> <p>Q = minimum required rate of discharge of air at standard conditions of 273.15 Kelvin (K) and 0.1013 MPa.</p> <p>F = fire exposure factor for different liquefied gas fuel types:</p> <p>$F = 1.0$ for tanks without insulation located on deck;</p> <p>$F = 0.5$ for tanks above the deck when insulation is approved by the Society. (Approval will be based on the use of a fireproofing material, the thermal conductance of insulation, and its stability under fire exposure);</p> <p>$F = 0.5$ for uninsulated independent tanks installed in holds;</p> <p>$F = 0.2$ for insulated independent tanks in holds (or uninsulated independent tanks in insulated holds);</p> <p>$F = 0.1$ for insulated independent tanks in inerted holds (or uninsulated independent tanks in inerted, insulated holds); and</p> <p>$F = 0.1$ for membrane tanks.</p>	<p style="text-align: center;">CHAPTER 6 FUEL CONTAINMENT SYSTEM</p> <p style="text-align: center;">Section 7 Pressure Relief System</p> <p>703. Sizing of pressure relieving system</p> <p>1. Sizing of pressure relief valves</p> <p>(1) PRVs are to have a combined relieving capacity for each liquefied gas fuel tank to discharge the greater of the following, with not more than a 20% rise in liquefied gas fuel tank pressure above the MARVS:</p> <p>(B) vapors generated under fire exposure computed using the following formula: 【See Guidance】</p> $Q = FGA^{0.82} \quad (\text{m}^3/\text{s})$ <p>where:</p> <p>Q = minimum required rate of discharge of air at standard conditions of 273.15 Kelvin (K) and 0.1013 MPa.</p> <p>F = fire exposure factor for different liquefied gas fuel types:</p> <p>$F = 1.0$ for tanks without insulation located on deck;</p> <p>$F = 0.5$ for tanks above the deck when insulation is approved by the Society. (Approval will be based on the use of a fireproofing material, the thermal conductance of insulation, and its stability under fire exposure);</p> <p>$F = 0.5$ for uninsulated independent tanks installed in holds;</p> <p>$F = 0.2$ for insulated independent tanks in holds (or uninsulated independent tanks in insulated holds);</p> <p>$F = 0.1$ for insulated independent tanks in inerted holds (or uninsulated independent tanks in inerted, insulated holds); and</p> <p>$F = 0.1$ for membrane tanks.</p>	<p>corregenda (change equation)</p> <p>style</p> <p>of</p>

Present	Amendment	Note
<p>For independent tanks partly protruding through the weather decks, the fire exposure factor is to be determined on the basis of the surface areas above and below deck.</p> <p>G = gas factor according to formula:</p> $G = \frac{12.4}{LD} \sqrt{\frac{ZT}{M}}$ <p>where:</p> <p>T = temperature in Kelvin at relieving conditions, i.e. 120 % of the pressure at which the pressure relief valve is set;</p> <p>L = latent heat of the material being vaporized at relieving conditions, in kJ/kg;</p> <p>D = a constant based on relation of specific heats k and is calculated as follows:</p> $D = \sqrt{k \left(\frac{2}{k+1} \right)^{\frac{k+1}{k-1}}}$ <p>where:</p> <p>k = ratio of specific heats at relieving conditions, and the value of which is between 1.0 and 2.2. If k is not known, $D = 0.606$ is to be used;</p> <p>Z = compressibility factor of the gas at relieving conditions; if not known, $Z = 1.0$ is to be used;</p> <p>M = molecular mass of the product.</p> <p>The gas factor of each liquefied gas fuel to be carried is to be determined and the highest value is to be used for PRV sizing.</p> <p>A = external surface area of the tank (m²), as for different tank types, as shown in Fig 6.4.</p>	<p>For independent tanks partly protruding through the weather decks, the fire exposure factor is to be determined on the basis of the surface areas above and below deck.</p> <p>G = gas factor according to formula:</p> $G = \frac{12.4}{LD} \sqrt{\frac{ZT}{M}}$ <p>where:</p> <p>T = temperature in Kelvin at relieving conditions, i.e. 120 % of the pressure at which the pressure relief valve is set;</p> <p>L = latent heat of the material being vaporized at relieving conditions, in kJ/kg;</p> <p>D = a constant based on relation of specific heats k and is calculated as follows:</p> $D = \sqrt{k \left(\frac{2}{k+1} \right)^{\frac{k+1}{k-1}}}$ <p>where:</p> <p>k = ratio of specific heats at relieving conditions, and the value of which is between 1.0 and 2.2. If k is not known, $D = 0.606$ is to be used;</p> <p>Z = compressibility factor of the gas at relieving conditions; if not known, $Z = 1.0$ is to be used;</p> <p>M = molecular mass of the product.</p> <p>The gas factor of each liquefied gas fuel to be carried is to be determined and the highest value is to be used for PRV sizing.</p> <p>A = external surface area of the tank (m²), as for different tank types, as shown in Fig 6.4.</p>	<p>corregenda (change equation) style of</p>

Present	Amendment	Note
<p>(2) For vacuum insulated tanks in fuel storage hold spaces and for tanks in fuel storage hold spaces separated from potential fire loads by <u>coffer dams</u> or surrounded by ship spaces with no fire load the following applies: If the pressure relief valves have to be sized for fire loads the fire factors according may be reduced to the following values: The minimum fire factor is $F = 0.1$</p> <p style="text-align: center;">$F = 0.5$ to $F = 0.25$ $F = 0.2$ to $F = 0.1$</p> <p>(3) The required mass flow of air at relieving conditions is given by: where density of air (ρ_{air}) = 1.293 kg/m³ (air at 273.15 K, 0.1013 MPa).</p>	<p>(2) For vacuum insulated tanks in fuel storage hold spaces and for tanks in fuel storage hold spaces separated from potential fire loads by <u>cofferdams</u> or surrounded by ship spaces with no fire load the following applies: If the pressure relief valves have to be sized for fire loads the fire factors according may be reduced to the following values: The minimum fire factor is $F = 0.1$</p> <p style="text-align: center;">$F = 0.5$ to $F = 0.25$ $F = 0.2$ to $F = 0.1$</p> <p>(3) The required mass flow of air at relieving conditions is given by:</p> <p style="text-align: center;">$\underline{M_{air} = Q \cdot \rho_{air}} \quad (\text{kg/s}),$</p> <p>where density of air (ρ_{air}) = 1.293 kg/m³ (air at 273.15 K, 0.1013 MPa).</p>	<p>corregenda (change style)</p> <p>corregenda (correct omitted equation and change style)</p>

Present	Amendment	Note
<p style="text-align: center;">CHAPTER 6 FUEL CONTAINMENT SYSTEM</p> <p style="text-align: center;">Section 8 Loading Limit for Liquefied Gas Fuel Tanks</p> <p>801. Loading limit [See Guidance]</p> <p>1. Storage tanks for liquefied gas are not to be filled to more than a volume equivalent to 98 % full at the reference temperature as defined in Ch 1, 201. 36. A loading limit curve for actual fuel loading temperatures is to be prepared from the following formula:</p> $LL = FL \frac{\rho_R}{\rho_L}$ <p>where:</p> <p><i>LL</i>(Loading limit) = loading limit as defined in Ch 1, 201. 27, expressed in per cent;</p> <p><i>FL</i>(Filling limit) = filling limit as defined in Ch 1, 201. 26 expressed in percent, here 98 %;</p> <p>ρ_R = relative density of fuel at the reference temperature; and</p> <p>ρ_L = relative density of fuel at the loading temperature</p>	<p style="text-align: center;">CHAPTER 6 FUEL CONTAINMENT SYSTEM</p> <p style="text-align: center;">Section 8 Loading Limit for Liquefied Gas Fuel Tanks</p> <p>801. Loading limit [See Guidance]</p> <p>1. Storage tanks for liquefied gas are not to be filled to more than a volume equivalent to 98 % full at the reference temperature as defined in Ch 1, 102. 36. A loading limit curve for actual fuel loading temperatures is to be prepared from the following formula:</p> $LL = FL \frac{\rho_R}{\rho_L}$ <p>where:</p> <p><i>LL</i>(Loading limit) = loading limit as defined in Ch 1, 102. 27, expressed in per cent;</p> <p><i>FL</i>(Filling limit) = filling limit as defined in Ch 1, 102. 26 expressed in percent, here 98 %;</p> <p>ρ_R = relative density of fuel at the reference temperature; and</p> <p>ρ_L = relative density of</p>	<p>corregenda (correct references)</p>

Present	Amendment	Note
<p style="text-align: center;"> 〈Guidance relating to the Rules for the Classification of Ships Using Low-flashpoint Fuels〉 CHAPTER 11 FIRE SAFETY Section 3 Fire Protection </p> <p>301. Fire protection</p> <p>1. In applying 301. 1 of this Rules, fire protection means structural fire protection, not including <u>menas</u> of escape.</p> <p>2. Notwithstanding paragraph <u>1</u>, any enclosed spaces containing equipment for fuel preparation such as <u>pumps or compressors of other potential ignition sources</u> are to comply with Ch 11 Sec 8 of Rules (2024)</p> <p>3. In applying 301. 3 of this Rules, the following “other rooms with high fire risk” is to be as a minimum be considered, but not be restricted to:</p> <p>(1) <u>Cargo spaces</u> except:</p> <p style="margin-left: 20px;">(A) cargo tanks for liquids with <u>FP</u> above 60 °C</p> <p style="margin-left: 20px;">(B) the carriage of ore, coal, grain, unseasoned timber, non-combustible cargoes or cargoes which, in the opinion of the Society, constitute a low fire risk complying with Pt 8, Ch 8, 601. 4 of Rules for the classification of steel ships.</p> <p>(2) <u>Vehicle, Ro-Ro</u> and special category spaces</p> <p>(3) <u>Service spaces</u> (high risk): <u>Galleys</u>, pantries containing cooking appliances, saunas, paint lockers and store-rooms having areas of 4 m² or more, spaces for the storage of flammable liquids and workshops other than those forming part of the machinery space.</p> <p>(4) “<u>Accommodation spaces of greater fire risk for ships carrying more than 36 passengers: saunas, sale shops, barber shops and beauty parlours and public spaces containing furniture and furnishings of other than restricted fire risk and having a deck area of 50 m² or more.</u>”</p>	<p style="text-align: center;"> 〈Guidance relating to the Rules for the Classification of Ships Using Low-flashpoint Fuels〉 CHAPTER 11 FIRE SAFETY Section 3 Fire Protection </p> <p>301. Fire protection</p> <p>1. In applying 301. 1 of this Rules, fire protection means structural fire protection, not including <u>means</u> of escape.</p> <p>2. Notwithstanding paragraph <u>1</u>, any enclosed spaces containing equipment for fuel preparation such as <u>pumps, compressors or other potential ignition sources</u> are to comply with Ch 11, Sec 8 of this Rules. (2024)</p> <p>3. In applying 301. 3 of this Rules, the following “other rooms with high fire risk” is to be as a minimum be considered, but not be restricted to:</p> <p>(1) <u>cargo spaces</u> except:</p> <p style="margin-left: 20px;">(A) cargo tanks for liquids with <u>flashpoint</u> above 60 °C; <u>and</u></p> <p style="margin-left: 20px;">(B) the carriage of ore, coal, grain, unseasoned timber, non-combustible cargoes or cargoes which, in the opinion of the Society, constitute a low fire risk complying with Pt 8, Ch 8, 601. 4 of Rules for the classification of steel ships.</p> <p>(2) <u>vehicle, ro-ro</u> and special category spaces</p> <p>(3) <u>service spaces</u> (high risk): <u>galleys</u>, pantries containing cooking appliances, saunas, paint lockers and store-rooms having areas of 4 m² or more, spaces for the storage of flammable liquids and workshops other than those forming part of the machinery space; <u>and</u></p> <p>(4) <u>accommodation spaces of greater fire risk for ships carrying more than 36 passengers: saunas, sale shops, barber shops and beauty parlours and public spaces containing furniture and furnishings of other than restricted fire risk and having a deck area of 50 m² or more.</u></p>	<p>corregenda</p> <p>corregenda (ACS UI GF13(Rev.1))</p> <p>corregenda (MSC.1/Circ.1591)</p>

Amendment	Note
<p style="text-align: center;"> Guidance Relating to the Rules for the Classification of Ships Using Low-flashpoint Fuels </p> <p style="text-align: center;"> Annex 5 Requirements for Ships Using Methyl/Ethyl Alcohol as Fuel (2021) </p> <p style="text-align: center;"> Section 6 Fuel Containment System </p> <p>605. Inert gas availability on board</p> <ol style="list-style-type: none"> 1. Inert gas should be available permanently on board in order to achieve at least one trip from port to port considering maximum consumption of fuel expected and maximum length of trip expected and to keep tanks inerted during two weeks in harbour with minimum port consumption. 2. A production plant and/or adequate storage capacities might be used to achieve availability target defined in 1. 3. Fluid used for inerting should not modify the characteristics of the fuel. 4. The production plant, if fitted, should be capable of producing inert gas with oxygen content at no time greater than 5% by volume. A continuous-reading oxygen content meter should be fitted to the inert gas supply from the equipment and should be fitted with an alarm set at a maximum of 5% oxygen content by volume. The system should be designed to ensure that if the oxygen content exceeds 5% by volume, the inert gas should be automatically vented+ to atmosphere. 5. The system should be able to maintain an atmosphere with an oxygen content not exceeding 8% by volume in any part of any fuel tank. 6. An inert gas system should have pressure controls and monitoring arrangements appropriate to the fuel containment system. 7. Where a nitrogen generator or nitrogen storage facilities are installed in a separate compartment outside of the engine-room, the separate compartment should be fitted with an independent mechanical extraction ventilation system, providing a minimum of six air changes per hour. If the oxygen content is below 19% in the separate compartment, an alarm should be given. A minimum of two oxygen sensors should be provided in each space. Visual and audible alarms should be placed at each entrance to the inert gas room. 8. Nitrogen pipes should only be led through well ventilated spaces. Nitrogen pipes in enclosed spaces should: <ol style="list-style-type: none"> (1) have only a minimum of flange connections as needed for fitting of valves and be fully welded; and (2) be as short as possible. 9. Notwithstanding the provisions of 303.605., inert gas utilized for gas-freeing of tanks may be provided externally to the ship. 	<p>- Editorial error corrected.</p>

Present	Amendment	Note
<p style="text-align: center;"><High Speed and Light Craft></p> <p style="text-align: center;">Ch 4 HULL EQUIPMENT</p> <p style="text-align: center;">Section 1 Rudders</p> <p>106. Rudder plate, Rudder Frames and Rudder Main Pieces</p> <p>1. Rudder plate</p> <p>The rudder plate thickness t is not to be less than that obtained from the following formula :</p> <p>d : as specified in <u>Pt 3, Ch 1, 106.</u></p> <p style="text-align: center;">Section 2 Hull Appendages</p> <p>202. Materials and Workmanship</p> <p>The materials for members specified in this chapter are to comply with the requirements in <u>Pt 2</u> and <u>Pt 2, Ch 1.</u> of Rules for the Classification of Steel Ships.</p> <p style="text-align: center;">Section 4 Hatchways, Windows and other Openings</p> <p>402. Bulwarks, Freeing Ports, Side Scuttles, Ventilators</p> <p>2. Freeing Ports</p> <p>(7) Ro-Ro craft fitted with bow loading openings leading to open vehicle spaces is to comply with the provisions of <u>Pt 3, Ch 1, Sec 407.</u></p>	<p style="text-align: center;"><High Speed and Light Craft></p> <p style="text-align: center;">Ch 4 HULL EQUIPMENT</p> <p style="text-align: center;">Section 1 Rudders</p> <p>106. Rudder plate, Rudder Frames and Rudder Main Pieces</p> <p>1. Rudder plate</p> <p>The rudder plate thickness t is not to be less than that obtained from the following formula :</p> <p>d : as specified in <u>Ch 3, 101. 6.</u></p> <p style="text-align: center;">Section 2 Hull Appendages</p> <p>202. Materials and Workmanship</p> <p>The materials for members specified in this chapter are to comply with the requirements in <u>Ch 2</u> and <u>Pt 2, Ch 1.</u> of Rules for the Classification of Steel Ships.</p> <p style="text-align: center;">Section 4 Hatchways, Windows and other Openings</p> <p>402. Bulwarks, Freeing Ports, Side Scuttles, Ventilators</p> <p>2. Freeing Ports</p> <p>(7) Ro-Ro craft fitted with bow loading openings leading to open vehicle spaces is to comply with the provisions of <u>Ch 3, 104. 7.</u></p>	<p>- reference error</p> <p>- reference error</p> <p>- reference error</p>

Present	Amendment	Note
<p>403. Windows</p> <p>2. Thickness of glasses</p> <p>(1) The thickness of toughened safety glass panes is not to be less than that obtained from the following formula :</p> <p style="padding-left: 40px;">p : lateral pressure defined in Pt 3, Ch 2, 304.</p> <p>(2) The thickness of toughened safety glass panes may be reduced from that given by the formula in Pt 3, Ch 2, 304. when it is documented by a pressure test that the window fitted in the type of frame to be used is able to withstand a test pressure of 4 times the lateral design pressure according to previous Par 1 above without the window dropping out of the frame or leakage occurring. The thickness is not to be less than 5 mm.</p> <p>(3) Large glass doors or windows in the aft end of superstructures or deckhouses will be specially considered.</p> <p>(4) Windows of other materials than toughened safety glass ; i.e., polycarbonate, are to be tested in the type of frame to be used to a test pressure of 4 times the lateral design pressure according to Pt 3, Ch 2. It is to be documented that the window shows no sign of defects as specified in Par 2. Windows firmly fixed in the frames by bolting, gluing or other equivalent methods may be tested to a pressure of 2.5 times the lateral design pressure according to Pt 3, Ch 2. The thickness is not to be less than 5 mm.</p>	<p>403. Windows</p> <p>2. Thickness of glasses</p> <p>(1) The thickness of toughened safety glass panes is not to be less than that obtained from the following formula :</p> <p style="padding-left: 40px;">p : lateral pressure defined in Ch 3, 203. 4.</p> <p>(2) The thickness of toughened safety glass panes may be reduced from that given by the formula in Ch 3, 203. 4. when it is documented by a pressure test that the window fitted in the type of frame to be used is able to withstand a test pressure of 4 times the lateral design pressure according to previous Par 1 above without the window dropping out of the frame or leakage occurring. The thickness is not to be less than 5 mm.</p> <p>(3) Large glass doors or windows in the aft end of superstructures or deckhouses will be specially considered.</p> <p>(4) Windows of other materials than toughened safety glass ; i.e., polycarbonate, are to be tested in the type of frame to be used to a test pressure of 4 times the lateral design pressure according to Ch 3, Sec 2. It is to be documented that the window shows no sign of defects as specified in Par 2. Windows firmly fixed in the frames by bolting, gluing or other equivalent methods may be tested to a pressure of 2.5 times the lateral design pressure according to Ch 3, Sec 2. The thickness is not to be less than 5 mm.</p>	<p>- reference error</p> <p>- reference error</p> <p>- reference error</p>

Present	Correction	Reason
<p data-bbox="129 240 931 276"><Rules and Guidance for the Classification of FRP Ships></p> <p data-bbox="315 331 745 371">CHAPTER 1 GENERAL</p> <p data-bbox="383 408 678 443">Section 1 General</p> <p data-bbox="96 483 495 512">101. Application [See Guidance]</p> <p data-bbox="125 531 969 743">1. The survey and construction of ships of fibre reinforced plastics (hereinafter referred to as "FRP" and "FRP ships") to be registered in accordance with the Regulations for the Classification and Registry of Ships are to be as prescribed in these Rules. However, Light Craft or High-speed Light Craft defined in <u>Ch 1, 103.</u> of Rules and Guidance for the Classification of High Speed and Light Crafts were excepted.</p> <p data-bbox="931 842 965 871">⚓</p>	<p data-bbox="1025 240 1827 276"><Rules and Guidance for the Classification of FRP Ships></p> <p data-bbox="1211 331 1641 371">CHAPTER 1 GENERAL</p> <p data-bbox="1279 408 1574 443">Section 1 General</p> <p data-bbox="992 483 1391 512">101. Application [See Guidance]</p> <p data-bbox="1021 531 1865 743">1. The survey and construction of ships of fibre reinforced plastics (hereinafter referred to as "FRP" and "FRP ships") to be registered in accordance with the Regulations for the Classification and Registry of Ships are to be as prescribed in these Rules. However, Light Craft or High-speed Light Craft defined in Ch 1, 103. Ch 1, 101. 3 of Rules and Guidance for the Classification of High Speed and Light Crafts were excepted.</p> <p data-bbox="1827 842 1861 871">⚓</p>	<p data-bbox="1895 459 2089 528">- Typo : Citation errors</p>

Present	Correction	Reason
<p style="text-align: center;">〈Rules for the Classification of High Speed and Light Crafts〉</p> <p style="text-align: center;">CHAPTER 3 HULL STRUCTURES</p> <p style="text-align: center;">Section 1 Design Principles</p> <p>101. Definitions</p> <p>1. Application</p> <p>The definitions of symbols and terms used in this <u>part</u>, except otherwise specified, are to be in accordance with this section. And, the symbols and terms, not defined in this rules, are to be in accordance with Rules for the Classification of Steel Ships.</p> <p>102. General</p> <p>1. Application</p> <p>The requirements in this <u>part</u> are to be applied to light craft, or high speed and light craft constructed in steel, aluminium or fiber composites (FRP) and satisfy relevant requirements given in Ch 1. 101.3.</p> <p>3. Direct strength calculation [See Guidance]</p> <p>(1) Where approved by Society, scantlings of structure members may be determined based upon direct calculation. Where calculated scantlings based on direct calculation exceed the scantlings required in this <u>part</u>, the former is to be adopted.</p> <p>(2) Where the direct calculation specified in the Par 1 is carried out, the data necessary for the calculation are to be submitted to the Society.</p> <p style="text-align: right;">↓</p>	<p style="text-align: center;">〈Rules for the Classification of High Speed and Light Crafts〉</p> <p style="text-align: center;">CHAPTER 3 HULL STRUCTURES</p> <p style="text-align: center;">Section 1 Design Principles</p> <p>101. Definitions</p> <p>1. Application</p> <p>The definitions of symbols and terms used in this <u>partchapter</u>, except otherwise specified, are to be in accordance with this section. And, the symbols and terms, not defined in this rules, are to be in accordance with Rules for the Classification of Steel Ships.</p> <p>102. General</p> <p>1. Application</p> <p>The requirements in this <u>partchapter</u> are to be applied to light craft, or high speed and light craft constructed in steel, aluminium or fiber composites (FRP) and satisfy relevant requirements given in Ch 1. 101.3.</p> <p>3. Direct strength calculation [See Guidance]</p> <p>(1) Where approved by Society, scantlings of structure members may be determined based upon direct calculation. Where calculated scantlings based on direct calculation exceed the scantlings required in this <u>partchapter</u>, the former is to be adopted.</p> <p>(2) Where the direct calculation specified in the Par 1 is carried out, the data necessary for the calculation are to be submitted to the Society.</p> <p style="text-align: right;">↓</p>	<p>– Typo : Citation errors</p> <p>– Typo : Citation errors</p>

Present	Correction	Reason																												
<p style="text-align: center;"> 〈Guidance Relating to the Rules for the Classification of High Speed and Light Crafts〉 CHAPTER 1 CLASSIFICATION AND SURVEYS </p> <p>Table 1.1.1 Ship motion</p> <table border="1" data-bbox="107 555 954 730"> <thead> <tr> <th colspan="2">Rolling</th> <th colspan="2">Pitching</th> <th rowspan="2">Safety factor</th> </tr> <tr> <th>degree</th> <th>cycle 3)</th> <th>degree</th> <th>cycle</th> </tr> </thead> <tbody> <tr> <td>10°</td> <td>cycle of ship</td> <td>5°</td> <td>5 sec</td> <td>4 over</td> </tr> </tbody> </table> <p>(Note)</p> <ol style="list-style-type: none"> KG' is the value obtained from the following formula. $KG' = 0.5(KG + KB)$ KG = the vertical position of the centric of the ship KB = the vertical position of the buoyancy centric of the ship The centric of pitching is to be longitudinal position of the centric of the ship. The rolling cycle of the ship may be taken from T_R of Pt 3, Ch 2, 203. 2. of the Rule. 	Rolling		Pitching		Safety factor	degree	cycle 3)	degree	cycle	10°	cycle of ship	5°	5 sec	4 over	<p style="text-align: center;"> 〈Guidance Relating to the Rules for the Classification of High Speed and Light Crafts〉 CHAPTER 1 CLASSIFICATION AND SURVEYS </p> <p>Table 1.1.1 Ship motion</p> <table border="1" data-bbox="1003 555 1850 730"> <thead> <tr> <th colspan="2">Rolling</th> <th colspan="2">Pitching</th> <th rowspan="2">Safety factor</th> </tr> <tr> <th>degree</th> <th>cycle 3)</th> <th>degree</th> <th>cycle</th> </tr> </thead> <tbody> <tr> <td>10°</td> <td>cycle of ship</td> <td>5°</td> <td>5 sec</td> <td>4 over</td> </tr> </tbody> </table> <p>(Note)</p> <ol style="list-style-type: none"> KG' is the value obtained from the following formula. $KG' = 0.5(KG + KB)$ KG = the vertical position of the centric of the ship KB = the vertical position of the buoyancy centric of the ship The centric of pitching is to be longitudinal position of the centric of the ship. The rolling cycle of the ship may be taken from T_R of Pt 3, Ch 2, 203. 2. Ch 3, 202.3 (2) of the Rule. 	Rolling		Pitching		Safety factor	degree	cycle 3)	degree	cycle	10°	cycle of ship	5°	5 sec	4 over	<p>- Typo : Citation errors</p>
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<p style="text-align: center;">Annex 3-1 Guidance for the Direct Strength Assessment</p> <p>Table 1 Allowable Stresses for Stiffeners</p> <table border="1" data-bbox="107 451 958 879"> <tr> <td rowspan="2">Nominal local bending stress</td> <td>General</td> <td>$\sigma = 180/K \text{ (N/mm}^2\text{)}$</td> </tr> <tr> <td>Watertight bulkheads except collision bulkhead</td> <td>$\sigma = 245/K \text{ (N/mm}^2\text{)}$</td> </tr> <tr> <td colspan="2">Combined local bending stress/girder stress / extreme longitudinal stress</td> <td>$\sigma = 230 \sim 265/K^{(*)} \text{ (N/mm}^2\text{)}$</td> </tr> <tr> <td rowspan="2">Nominal shear stress</td> <td>General</td> <td>$\tau = 90/K \text{ (N/mm}^2\text{)}$</td> </tr> <tr> <td>Watertight bulkheads except collision bulkhead</td> <td>$\tau = 120/K \text{ (N/mm}^2\text{)}$</td> </tr> </table> <p>(*) : In case of girder stress, longitudinal stress is as specified in 304. 3.</p>	Nominal local bending stress	General	$\sigma = 180/K \text{ (N/mm}^2\text{)}$	Watertight bulkheads except collision bulkhead	$\sigma = 245/K \text{ (N/mm}^2\text{)}$	Combined local bending stress/girder stress / extreme longitudinal stress		$\sigma = 230 \sim 265/K^{(*)} \text{ (N/mm}^2\text{)}$	Nominal shear stress	General	$\tau = 90/K \text{ (N/mm}^2\text{)}$	Watertight bulkheads except collision bulkhead	$\tau = 120/K \text{ (N/mm}^2\text{)}$	<p style="text-align: center;">Annex 3-1 Guidance for the Direct Strength Assessment</p> <p>Table 1 Allowable Stresses for Stiffeners</p> <table border="1" data-bbox="999 432 1850 860"> <tr> <td rowspan="2">Nominal local bending stress</td> <td>General</td> <td>$\sigma = 180/K \text{ (N/mm}^2\text{)}$</td> </tr> <tr> <td>Watertight bulkheads except collision bulkhead</td> <td>$\sigma = 245/K \text{ (N/mm}^2\text{)}$</td> </tr> <tr> <td colspan="2">Combined local bending stress/girder stress / extreme longitudinal stress</td> <td>$\sigma = 230 \sim 265/K^{(*)} \text{ (N/mm}^2\text{)}$</td> </tr> <tr> <td rowspan="2">Nominal shear stress</td> <td>General</td> <td>$\tau = 90/K \text{ (N/mm}^2\text{)}$</td> </tr> <tr> <td>Watertight bulkheads except collision bulkhead</td> <td>$\tau = 120/K \text{ (N/mm}^2\text{)}$</td> </tr> </table> <p>(*) : In case of girder stress, longitudinal stress is as specified in Ch 3, 304. 3 of the Rule.</p>	Nominal local bending stress	General	$\sigma = 180/K \text{ (N/mm}^2\text{)}$	Watertight bulkheads except collision bulkhead	$\sigma = 245/K \text{ (N/mm}^2\text{)}$	Combined local bending stress/girder stress / extreme longitudinal stress		$\sigma = 230 \sim 265/K^{(*)} \text{ (N/mm}^2\text{)}$	Nominal shear stress	General	$\tau = 90/K \text{ (N/mm}^2\text{)}$	Watertight bulkheads except collision bulkhead	$\tau = 120/K \text{ (N/mm}^2\text{)}$	<p>-Typo :Citation errors</p>
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Present				Correction				Reason
Table 6 Load cases for longitudinal strength evaluation of catamaran				Table 6 Load cases for longitudinal strength evaluation of catamaran				- Typo : Citation errors
No	Load cases		Pt 3, Ch 2 of the Rules	No.	Load cases		Ch 3, sec 2 of the Rules	
1	Vertical bending moment (Hogging)	Max(Mhog , MB)	401. 2. (2), 401. 4. (2)	1	Vertical bending moment (Hogging)	Max(Mhog , MB)	204.1 (2) (B), 204.1 (4) (B)	
2	Vertical bending moment (Sagging)	Max(Msag , MB)	401. 2. (3), 401. 4. (2)	2	Vertical bending moment (Sagging)	Max(Msag , MB)	204.1 (2) (C), 204.1 (4) (B)	
3	Transverse bending moment	MS	402. 2. (2)	3	Transverse bending moment	MS	204.2 (2) (B)	
4	Longitudinal/transverse torsional moment	MP + MT	402. 3 / 402. 4	4	Longitudinal/transverse torsional moment	MP + MT	204. 2 (3) and 204. 2 (4)	
5	Load combination 1	0.8 Max(Msag , MB) + 0.6(MP + MT)		5	Load combination 1	0.8 Max(Msag , MB) + 0.6(MP + MT)		
6	Load combination 2	0.6 Max(Msag , MB) + 0.8(MP + MT)		6	Load combination 2	0.6 Max(Msag , MB) + 0.8(MP + MT)		
7	Load combination 3	0.7Ms + (MP + MT)		7	Load combination 3	0.7Ms + (MP + MT)		
8	Load combination 4	Ms + 0.7(MP + Mt)		8	Load combination 4	Ms + 0.7(MP + Mt)		

Present	Correction	Reason
<p style="text-align: center;">CHAPTER 5 MACHINERY INSTALLATIONS</p> <p style="text-align: center;">Section 1 General</p> <p>101. General</p> <p>1. Application</p> <p>(1) In case of high speed craft engaged on international voyages, the HSC Code is to be applied.</p> <p>(2) Other requirements for machinery installations not specified in this chapter are, in principle, to be in accordance with relevant requirements in Rules for the Classification of Steel Ships, other equivalent rules, or standards deemed appropriate by this Society. 【See Guidance】</p> <p>2. Equivalency</p> <p>In case of machinery installations that are not appropriate to the requirements of this <u>part</u>, they may be accepted, if the Society considers them appropriate.</p>	<p style="text-align: center;">CHAPTER 5 MACHINERY INSTALLATIONS</p> <p style="text-align: center;">Section 1 General</p> <p>101. General</p> <p>1. Application</p> <p>(1) In case of high speed craft engaged on international voyages, the HSC Code is to be applied.</p> <p>(2) Other requirements for machinery installations not specified in this chapter are, in principle, to be in accordance with relevant requirements in Rules for the Classification of Steel Ships, other equivalent rules, or standards deemed appropriate by this Society. 【See Guidance】</p> <p>2. Equivalency</p> <p>In case of machinery installations that are not appropriate to the requirements of this <u>partchapter</u>, they may be accepted, if the Society considers them appropriate</p>	<p>–Typo :Citation errors</p>

현행	수정	이유
<p data-bbox="107 244 963 279"><Rules for the Classification of High Speed and Light Crafts></p> <p data-bbox="161 312 913 347">Section 4 Structure Principles in Aluminium Alloy</p> <p data-bbox="91 381 277 408">406. Stiffeners</p> <p data-bbox="125 434 349 461">1. Section modulus</p> <p data-bbox="159 475 981 564">(6) The shear area of longitudinals or transverse stiffeners supporting the bottom plating is not to be less than that obtained from the following formula :</p> $A_S = \frac{6.7P_{sl}(l-S)S}{\tau_{sl}} \quad (\text{cm}^3) \quad (2020)$ <p data-bbox="203 727 611 831"> τ_{sl} : allowable stress, $90/K_a$ S : spacing of stiffeners (m). P_{sl} : as defined in (5). </p>	<p data-bbox="1019 244 1874 279"><Rules for the Classification of High Speed and Light Crafts></p> <p data-bbox="1072 312 1825 347">Section 4 Structure Principles in Aluminium Alloy</p> <p data-bbox="1008 381 1193 408">406. Stiffeners</p> <p data-bbox="1041 434 1265 461">1. Section modulus</p> <p data-bbox="1075 475 1897 564">(6) The shear area of longitudinals or transverse stiffeners supporting the bottom plating is not to be less than that obtained from the following formula :</p> $A_S = \frac{6.7P_{sl}(l-S)S}{\tau_{sl}} \quad (\text{cm}^2) \quad (2020)$ <p data-bbox="1115 727 1523 831"> τ_{sl} : allowable stress, $90/K_a$ S : spacing of stiffeners (m). P_{sl} : as defined in (5). </p>	<p data-bbox="1917 485 2148 574">- Typo Shear area unit $\text{cm}^3 \rightarrow \text{cm}^2$</p>

현 행

406. Stiffeners

Table 3.3.15 Spacing between Tripping Brackets

Girder type		S_T (mm)
Girders with symmetrical face plate	<ul style="list-style-type: none"> - Bottom and deck transverses - Stringers, vertical webs and 	$0.02 b_f$ max. 6 m
	<ul style="list-style-type: none"> - Longitudinal girders in bottom and strength deck for $L > 50$ m within $0.5 L$ amidships - Stringers and vertical webs in tanks and machinery spaces - Vertical webs supporting single bottom girders and transverses 	$0.014 b_f$ max. 4 m
Girders with unsymmetrical face plate		not more than 10 times the width of face plate max. 1.5 m
If the web of a strength member forms an angle with the perpendicular to the craft's side of less than 80° , S_T is to exceed $0.007 b_f$		
NOTE : b_f = flange breadth (mm) S_T = distance (m) between transverse girders.		

수 정

406. Stiffeners

Table 3.3.15 Spacing between Tripping Brackets

Girder type		S_T (mm)
Girders with symmetrical face plate	<ul style="list-style-type: none"> - Bottom and deck transverses - Stringers, vertical webs and <u>Longitudinal girders</u> 	$0.02 b_f$ max. 6 m
	<ul style="list-style-type: none"> - Longitudinal girders in bottom and strength deck for $L > 50$ m within $0.5 L$ amidships - Stringers and vertical webs in tanks and machinery spaces - Vertical webs supporting single bottom girders and transverses 	$0.014 b_f$ max. 4 m
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NOTE : b_f = flange breadth (mm) S_T = distance (m) between transverse girders.		

이 유

- Typo
Omission of content

현 행

Table 4.3.2 Bower Anchors, Chain Cables and Ropes (continued)

Equipment letter	Equipment number		Bower anchors			Stud link chain cable for bower anchors ⁽¹⁾				Mooring line		
			Mass (kg)			Total Length (mm)	Diameter			Breaking load (kN)	Number	Length (m)
	Number	HP	SH	Grade 1	Grade 2		Grade 3					
-omit-												
NOTE : (1) Chain cable may be substituted by wire or synthetic fibre rope, according to 305. 1.												



수 정

Table 4.3.2 Bower Anchors, Chain Cables and Ropes (continued)

Equipment letter	Equipment number		Bower anchors			Stud link chain cable for bower anchors ⁽¹⁾				Mooring line		
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-omit-												
NOTE : (1) Chain cable may be substituted by wire or synthetic fibre rope, according to 305. 1.												



이 유

- Typo
Anchors chain unit mm
→ m

Present	Amendment	Note
<p data-bbox="138 229 936 271" style="color: blue;">〈Guidance for Ships for Navigation in Ice〉</p> <p data-bbox="210 322 864 367" style="text-align: center;">Ch 1 STRENGTHENING FOR ~</p> <p data-bbox="398 405 672 446" style="text-align: center;">Sec 1 General</p> <p data-bbox="94 491 295 520">101. Application</p> <p data-bbox="120 542 981 692">3. In principle, the requirements in this chapter are applied to the ice strengthening of ships which are intended to navigate in the Northern Baltic that are subject to the Finnish-Swedish Ice class Rules 2017 or in the Canadian Arctic that are subject to the Arctic Shipping Pollution Prevention Regulations(see Annex 1, 101).</p> <p data-bbox="170 740 900 785" style="text-align: center;">Ch 2 SHIPS FOR NAVIGATION ~</p> <p data-bbox="183 807 887 852" style="text-align: center;">Sec 2 Structural Requirements for ~</p> <p data-bbox="94 900 286 928">202. Hull areas</p> <p data-bbox="120 951 981 1037">4. Fig 2.1 notwithstanding, the aft boundary of the Bow region need not be more than <u>0.45L</u> aft of the fore side of the stem at the intersection with the upper ice waterline (UIWL). (2021)</p> <p data-bbox="94 1098 371 1126">203. Design ice loads</p> <p data-bbox="120 1149 573 1177">2. Glancing impact load characteristics</p> <p data-bbox="156 1193 555 1222">(2) Hull areas other than the bow</p> <p data-bbox="197 1225 232 1254">(A)</p> <p data-bbox="241 1257 277 1286">(b)</p> $DF = \text{ship displacement factor}$ $= D_{UI}^{0.64} \quad \text{if } D \leq CF_{DIS}$ $= CF_{DIS}^{0.64} + 0.10(D - CF_{DIS}) \quad \text{if } D > CF_{DIS}$	<p data-bbox="1043 229 1841 271" style="color: blue;">〈Guidance for Ships for Navigation in Ice〉</p> <p data-bbox="1115 322 1778 367" style="text-align: center;">Ch 1 STRENGTHENING FOR ~</p> <p data-bbox="1303 405 1576 446" style="text-align: center;">Sec 1 General</p> <p data-bbox="999 491 1200 520">101. Application</p> <p data-bbox="1025 542 1886 692">3. In principle, the requirements in this chapter are applied to the ice strengthening of ships which are intended to navigate in the Northern Baltic that are subject to the Finnish-Swedish Ice class Rules 2017 or in the Canadian Arctic that are subject to the Arctic Shipping <u>Safety and</u> Pollution Prevention Regulations(see Annex 1, 101).</p> <p data-bbox="1075 740 1805 785" style="text-align: center;">Ch 2 SHIPS FOR NAVIGATION ~</p> <p data-bbox="1088 807 1792 852" style="text-align: center;">Sec 2 Structural Requirements for ~</p> <p data-bbox="999 900 1191 928">202. Hull areas</p> <p data-bbox="1025 951 1886 1037">4. Fig 2.1 notwithstanding, the aft boundary of the Bow region need not be more than <u>0.45L_{UI}</u> aft of the fore side of the stem at the intersection with the upper ice waterline (UIWL). (2021)</p> <p data-bbox="999 1098 1276 1126">203. Design ice loads</p> <p data-bbox="1025 1149 1478 1177">2. Glancing impact load characteristics</p> <p data-bbox="1061 1193 1460 1222">(2) Hull areas other than the bow</p> <p data-bbox="1102 1225 1137 1254">(A)</p> <p data-bbox="1155 1257 1191 1286">(b)</p> $DF = \text{ship displacement factor}$ $= D_{UI}^{0.64} \quad \text{if } D_{UI} \leq CF_{DIS}$ $= CF_{DIS}^{0.64} + 0.10(D - CF_{DIS}) \quad \text{if } D_{UI} > CF_{DIS}$	<p data-bbox="1912 612 1980 641">-error</p> <p data-bbox="1912 941 1980 970">-error</p> <p data-bbox="1912 1315 2105 1343">-error ($D \rightarrow D_{UI}$)</p>

Present	Amendment	Note
<p style="text-align: center;">Ch 3 SHIPS WITH ICE BREAKING ~</p> <p style="text-align: center;">Section 2 Strengthening of Arctic class ~</p> <p>202. Requirements to hull configuration</p> <p>5. In the afterbody of Icebreakers and <u>Arctic class ships</u>, there shall be appendage(ice knife) aft of the rudder to protect the latter on the sternway.</p> <p>8. In <u>Arctic8 ~ Arctic9</u> class ships, bulbous bow is not permitted. In Arctic4 class ships, this kind of bow is subject to special consideration by the Society.</p> <p>203. Region of ice strengthening</p> <p>1. There are ice strengthening regions lengthwise as follows.</p> <p style="margin-left: 20px;"><u>forward region</u> - A</p> <p style="margin-left: 20px;"><u>forward intermediate region</u> - B</p> <p style="margin-left: 20px;"><u>midship region</u> - C</p> <p style="margin-left: 20px;"><u>aft region</u> - D</p> <p>2. There are ice strengthening regions transversely as follows.</p> <p style="margin-left: 20px;"><u>region from h_1, the upper of UIWL to h_3, the lower of LIWL</u> - 1</p> <p style="margin-left: 20px;"><u>region from the lower edge of region 1 to the upper edge of bilge strake</u> - 2</p> <p style="margin-left: 20px;"><u>bilge strake</u> - 3</p> <p style="margin-left: 20px;"><u>region from the lower edge of bilge strake to the center line</u> - 4</p>	<p style="text-align: center;">Ch 3 SHIPS WITH ICE BREAKING ~</p> <p style="text-align: center;">Section 2 Strengthening of Arctic class ~</p> <p>202. Requirements to hull configuration</p> <p>5. In the afterbody of Icebreakers and <u>Arctic class (Arctic4 ~ Arctic9) ships</u>, there shall be appendage(ice knife) aft of the rudder to protect the latter on the sternway.</p> <p>8. In <u>Arctic5 ~ Arctic9</u> class ships, bulbous bow is not permitted. In Arctic4 class ships, this kind of bow is subject to special consideration by the Society.</p> <p>203. Region of ice strengthening</p> <p>1. There are ice strengthening regions lengthwise as follows.</p> <p style="margin-left: 20px;"><u>Region A : forward region</u></p> <p style="margin-left: 20px;"><u>Region B : forward intermediate region</u></p> <p style="margin-left: 20px;"><u>Region C : midship region</u></p> <p style="margin-left: 20px;"><u>Region D : aft region</u></p> <p>2. There are ice strengthening regions transversely as follows.</p> <p style="margin-left: 20px;"><u>Region 1 : region from h_1, the upper of UIWL to h_3, the lower of LIWL</u></p> <p style="margin-left: 20px;"><u>Region 2 : region from the lower edge of region 1 to the upper edge of bilge strake</u></p> <p style="margin-left: 20px;"><u>Region 3 : bilge strake</u></p> <p style="margin-left: 20px;"><u>Region 4 : region from the lower edge of bilge strake to the center line</u></p>	<p>-</p> <p>- error (Eng.)</p> <p>- error (Eng.)</p>

Present

Table 3.9 The requirements of 203. apply to the regions

Ship class	Regions transversely															
	1				2				3				4			
	Regions lengthwise															
									A	B	C	D	A	B	C	D
Icebreaker4, Icebreaker5, Icebreaker6, Arctic8, Arctic9									○	○	○	○	○	○	○	○
Arctic7									○	○	○	○	○	○		○
Icebreaker3, Arctic6									○	○	○	○	○	○		○
Arctic5									○	○		⊖	○			
Arctic4									○	○		⊖	○			

215. Plate structures

3.

where

$$t_0 = \frac{0.866}{\alpha} \left[1.1 \frac{p_1}{\sigma_y} b \left(1 - \frac{b}{4l}\right) - 0.5 \frac{Z_f l 10^{-3}}{1.15 \alpha l_1 l_2} \left(\frac{d_f}{10l}\right)^{1.5} - \frac{0.1 f_{st}}{a_1} \right]$$

d_f = refer to 209. 2.

Amendment

Table 3.9 The requirements of 203. apply to the regions

Ship class	Regions transversely															
	1				2				3				4			
	Regions lengthwise															
									A	B	C	D	A	B	C	D
Icebreaker4, Icebreaker5, Icebreaker6, Arctic8, Arctic9									○	○	○	○	○	○	○	○
Arctic7									○	○	○	○	○	○		○
Icebreaker3, Arctic6									○	○	○	○	○	○		○
Arctic5									○	○	○	○	○	○	○	
Arctic4									○	○		○	○	○	○	

215. Plate structures

3.

where

$$t_0 = \frac{0.866}{\alpha} \left[1.1 \frac{p_1}{\sigma_y} b \left(1 - \frac{b}{4l}\right) - 0.5 \frac{Z_f l 10^{-3}}{1.15 \alpha l_1 l_2} \left(\frac{d_w}{10l}\right)^{1.5} - \frac{0.1 f_{st}}{a_1} \right]$$

d_w = refer to 209. 2.

Note

-error

- $d_f \rightarrow d_w$

- $d_f \rightarrow d_w$

Present										Amendment										Note																																																																																																																																																															
Ch 4 Winterization Section 2 Winterization H - ~										Ch 4 Winterization Section 2 Winterization H - ~																																																																																																																																																																									
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<p>411. Ice removal and prevention measures</p> <p>3. A minimum of the following manual tools for removing ice are to be provided, provided, with at least one set of tools at each storage location. Storage locations should be as given in <u>511</u>. A set of tools is to comprise at least the following:</p> <p>ANNEX 1 Strengthening for navigation in ice</p> <p>102. Classification of ice strengthening</p> <p>2. The correspondence of Ice classes specified in Ch 1, 201. of the Rules with those in the <u>Arctic Shipping Pollution Prevention Regulation</u> is given in Table 1.3.</p> <p>Table 1.3 The correspondence of Arctic classes between the Society and the Arctic Shipping Pollution Prevention Regulation</p> <table border="1" data-bbox="129 1040 945 1401"> <thead> <tr> <th>Ice class of the Society</th> <th>Arctic class of the <u>Arctic Shipping Pollution Prevention Regulations</u></th> </tr> </thead> <tbody> <tr> <td>IA Super</td> <td>Type A</td> </tr> <tr> <td>IA</td> <td>Type B</td> </tr> <tr> <td>IB</td> <td>Type C</td> </tr> <tr> <td>IC</td> <td>Type D</td> </tr> <tr> <td>ID</td> <td>Type D</td> </tr> </tbody> </table>	Ice class of the Society	Arctic class of the <u>Arctic Shipping Pollution Prevention Regulations</u>	IA Super	Type A	IA	Type B	IB	Type C	IC	Type D	ID	Type D	<p>411. Ice removal and prevention measures</p> <p>3. A minimum of the following manual tools for removing ice are to be provided, provided, with at least one set of tools at each storage location. Storage locations should be as given in <u>4</u>. A set of tools is to comprise at least the following:</p> <p>ANNEX 1 Strengthening for navigation in ice</p> <p>102. Classification of ice strengthening</p> <p>2. The correspondence of Ice classes specified in Ch 1, 201. of the Rules with those in the <u>Arctic Shipping Safety and Pollution Prevention Regulation</u> is given in Table 1.3.</p> <p>Table 1.3 The correspondence of Arctic classes between the Society and the Arctic Shipping Pollution Prevention Regulation</p> <table border="1" data-bbox="1034 1040 1850 1401"> <thead> <tr> <th>Ice class of the Society</th> <th>Arctic class of the <u>Arctic Shipping Safety and Pollution Prevention Regulations</u></th> </tr> </thead> <tbody> <tr> <td>IA Super</td> <td>Type A</td> </tr> <tr> <td>IA</td> <td>Type B</td> </tr> <tr> <td>IB</td> <td>Type C</td> </tr> <tr> <td>IC</td> <td>Type D</td> </tr> <tr> <td>ID</td> <td>Type D</td> </tr> </tbody> </table>	Ice class of the Society	Arctic class of the <u>Arctic Shipping Safety and Pollution Prevention Regulations</u>	IA Super	Type A	IA	Type B	IB	Type C	IC	Type D	ID	Type D	<p>- error</p> <p>- error</p>
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Present	Amendment	Note
<p style="text-align: center; color: blue;">〈Ships for Navigation in Ice〉</p> <p style="text-align: center;">Ch 1 STRENGTHENING FOR NAVIGATION IN ICE</p> <p style="text-align: center;">Section 3 Hull Structural Design</p> <p>309. Bow</p> <p>1. Stem</p> <p>(2) The plate thickness of a shaped plate stem and in the case of a blunt bow, any part of the shell where angle α and ψ as specified in 502.1 are respectively not less than 30 degrees and 75 degrees, is to be obtained from the formula in <u>301.2</u> using the following values ;</p>	<p style="text-align: center; color: blue;">〈Ships for Navigation in Ice〉</p> <p style="text-align: center;">Ch 1 STRENGTHENING FOR NAVIGATION IN ICE</p> <p style="text-align: center;">Section 3 Hull Structural Design</p> <p>309. Bow</p> <p>1. Stem</p> <p>(2) The plate thickness of a shaped plate stem and in the case of a blunt bow, any part of the shell where angle α and ψ as specified in 502.1 are respectively not less than 30 degrees and 75 degrees, is to be obtained from the formula in <u>303.2</u> using the following values ;</p>	<p>-HUT4000-2042-2025 error (국/영)</p>

Present

Amendment

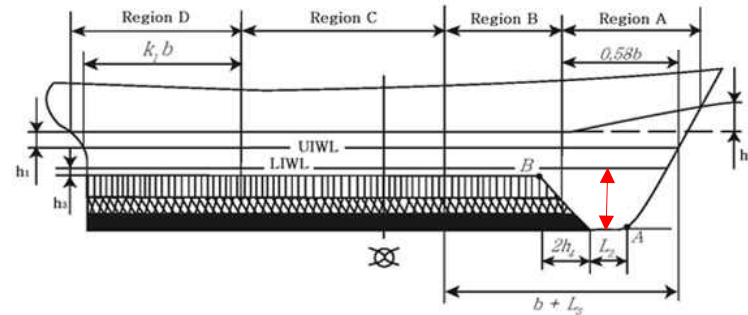
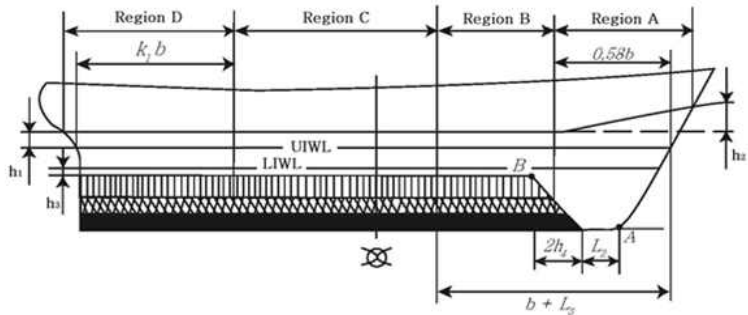
Note

〈Guidance for Ships for Navigation in Ice〉

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Ch. 3
Section 2 Strengthening of Arctic ~

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h_4

Table 3.11 Material grade requirements for classes I, II and III at ~ Class I

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Plate thickness in (mm)	-20/-25 °C		-26/-35 °C		-36/-45 °C		-46/-55 °C	
	MS	HT	MS	HT	MS	HT	MS	HT

Plate thickness in (mm)	-16 /-25 °C		-26/-35 °C		-36/-45 °C		-46/-55 °C	
	MS	HT	MS	HT	MS	HT	MS	HT

Class II

Class II

Plate thickness in (mm)	-20/-25 °C		-26/-35 °C		-36/-45 °C		-46/-55 °C	
	MS	HT	MS	HT	MS	HT	MS	HT

Plate thickness in (mm)	-16 /-25 °C		-26/-35 °C		-36/-45 °C		-46/-55 °C	
	MS	HT	MS	HT	MS	HT	MS	HT

Class III

Class III

Plate thickness in (mm)	-20/-25 °C		-26/-35 °C		-36/-45 °C		-46/-55 °C	
	MS	HT	MS	HT	MS	HT	MS	HT
20 < t ≤ 25	E	EH	E	EH	-	FH	-	FH
35 < t ≤ 40	E	EH	-	FH	-	FH	-	-

Plate thickness in (mm)	-16 /-25 °C		-26/-35 °C		-36/-45 °C		-46/-55 °C	
	MS	HT	MS	HT	MS	HT	MS	HT
20 < t ≤ 25	E	EH	E	EH	E	FH	-	FH
35 < t ≤ 40	E	FH	-	FH	-	FH	-	-

Present	Amendment	Note
<p style="text-align: center;">CH. 4 Winterization</p> <p style="text-align: center;">Section 3 Winterization M – Materials for equipment and components at low temperatures</p> <p>305. Piping, valves and fittings</p> <p>2. For the application of Table 4.7 Class I, as given in Pt 5, Ch 6 are to be reversed, e.g. <u>Class 3</u> is to be taken as Class I.</p> <p style="text-align: center;">Section 4 Winterization E3(t) – Main component and sub-component</p> <p>404. Winterization of auxiliary machinery systems and deck working areas</p> <p>14. The equipment and systems for accommodation and pilot ladders are to comply with the requirements in <u>408</u>.</p> <p>408. Winterization of spaces/compartments</p> <p>3. Heating arrangements (in addition to, and not necessarily serviced by, the air-conditioning system as specified in <u>408</u>, are to be provided for spaces containing machinery and equipment for essential or emergency services and for spaces accessed during ship operation in order that equipment may be maintained. ~</p>	<p style="text-align: center;">CH. 4 Winterization</p> <p style="text-align: center;">Section 3 Winterization M – Materials for equipment and components at low temperatures</p> <p>305. Piping, valves and fittings</p> <p>2. For the application of Table 4.7 Class I, as given in Pt 5, Ch 6 are to be reversed, e.g. <u>Class III</u> is to be taken as Class I.</p> <p style="text-align: center;">Section 4 Winterization E3(t) – Main component and sub-component</p> <p>404. Winterization of auxiliary machinery systems and deck working areas</p> <p>14. The equipment and systems for accommodation and pilot ladders are to comply with the requirements in <u>405</u>.</p> <p>408. Winterization of spaces/compartments</p> <p>3. Heating arrangements (in addition to, and not necessarily serviced by, the air-conditioning system as specified in <u>1</u>, are to be provided for spaces containing machinery and equipment for essential or emergency services and for spaces accessed during ship operation in order that equipment may be maintained. ~</p>	

Present	Amendment	Note
<p data-bbox="159 240 920 316">Section 8 Winterization D – Alternative design (2017)</p> <p data-bbox="96 344 387 373">801. Alternative design</p> <p data-bbox="125 395 981 485">1. Consideration may be given to alternative designs which do not comply with the requirements of Sec 3 on the basis of equivalency and agreement between the Owner and Builder Shipbuilder.</p>	<p data-bbox="1068 240 1830 316">Section 8 Winterization D – Alternative design (2017)</p> <p data-bbox="1005 344 1296 373">801. Alternative design</p> <p data-bbox="1034 395 1890 513">1. Consideration may be given to alternative designs which do not comply with the requirements of Sec 3 to Sec 7 and Sec 9 on the basis of equivalency and agreement between the Owner and Builder Shipbuilder.</p>	

Present	Amendment	Note
<p style="text-align: center;"> 〈Rules for the Classification of Floating Docks〉 CHAPTER 5 Hull Structure Section 1 ~ 3 〈omitted〉 Section 4 Structural Detail and Local Strength 401. ~405. 〈omitted〉 406. Cross tie The sectional area of cross ties, where fitted between the stiffeners, frames, girders, web frames etc. is not to be less than obtained from the following formula. $2.2Shb \quad (\text{cm}^3)$ where: <i>S</i> : space of the stiffeners etc. supported by the cross tie in meters: <i>b</i> : distance between the mid-point of two adjacent spans of stiffeners etc. supported by the cross tie in meters. <i>h</i> : the maximum head in meters to be determined in accordance with the requirements of 404. or 405. as applicable. 〈omitted〉 </p>	<p style="text-align: center;"> 〈Rules for the Classification of Floating Docks〉 CHAPTER 5 Hull Structure Section 1 ~ 3 〈same as the present〉 Section 4 Structural Detail and Local Strength 401. ~405. 〈same as the present〉 406. Cross tie The sectional area of cross ties, where fitted between the stiffeners, frames, girders, web frames etc. is not to be less than obtained from the following formula. $2.2Shb \quad (\text{cm}^2)$ where: <i>S</i> : space of the stiffeners etc. supported by the cross tie in meters: <i>b</i> : distance between the mid-point of two adjacent spans of stiffeners etc. supported by the cross tie in meters. <i>h</i> : the maximum head in meters to be determined in accordance with the requirements of 404. or 405. as applicable. 〈same as the present〉 </p>	<p>– Revision of the unit</p>

Present	Amendment	Note
<p data-bbox="129 164 947 196"><Rules for the classification of Mobile Offshore Units></p> <p data-bbox="129 260 947 336">CHAPTER 3 HULL CONSTRUCTION AND EQUIPMENT</p> <p data-bbox="327 392 748 424">Section 4 Ice Strengthening</p> <p data-bbox="91 480 342 504">401. Reinforcement</p> <p data-bbox="129 528 981 675">1. Units designed to be located in areas where ice strengthening may be necessary will be specially considered and, provided that the unit is reinforced as necessary for operation in the specified ice conditions to the satisfaction of the Society, and an appropriate Additional Special Feature Notations may be added to the Class Notation by the Society.</p> <p data-bbox="129 695 981 751">2. Ice strengthening for surface type units is to be in accordance with Pt 3, Ch 20 of Rules for the Classification of Steel Ships.</p>	<p data-bbox="1037 164 1854 196"><Rules for the classification of Mobile Offshore Units></p> <p data-bbox="1037 260 1854 336">CHAPTER 3 HULL CONSTRUCTION AND EQUIPMENT</p> <p data-bbox="1234 392 1657 424">Section 4 Ice Strengthening</p> <p data-bbox="1003 480 1254 504">401. Reinforcement</p> <p data-bbox="1037 528 1888 675">1. Units designed to be located in areas where ice strengthening may be necessary will be specially considered and, provided that the unit is reinforced as necessary for operation in the specified ice conditions to the satisfaction of the Society, and an appropriate Additional Special Feature Notations may be added to the Class Notation by the Society.</p> <p data-bbox="1037 695 1888 751">2. Ice strengthening for surface type units is to be in accordance with <u>Ch 1 of Guidance for Ship for Navigation in Ice.</u></p>	<p data-bbox="1912 715 2107 770">– corrigenda (correct references)</p>

Present	Amendment	Note
<p style="text-align: center;"> 〈Rules for the classification of Mobile Offshore Drilling Units〉 CHAPTER 3 HULL CONSTRUCTION AND EQUIPMENT Section 16 Ice Strengthening 1601. Reinforcement 1. Units designed to be located in areas where ice strengthening may be necessary will be specially considered and, provided that the unit is reinforced as necessary for operation in the specified ice conditions to the satisfaction of the Society, and an appropriate Additional Special Feature Notations may be added to the Class Notation by the Society. 2. Ice strengthening for surface type units is to be in accordance with Pt 3, Ch 20 of Rules for the Classification of Steel Ships. </p>	<p style="text-align: center;"> 〈Rules for the classification of Mobile Offshore Drilling Units〉 CHAPTER 3 HULL CONSTRUCTION AND EQUIPMENT Section 16 Ice Strengthening 1601. Reinforcement 1. Units designed to be located in areas where ice strengthening may be necessary will be specially considered and, provided that the unit is reinforced as necessary for operation in the specified ice conditions to the satisfaction of the Society, and an appropriate Additional Special Feature Notations may be added to the Class Notation by the Society. 2. Ice strengthening for surface type units is to be in accordance with <u>Ch 1 of Guidance for Ship for Navigation in Ice.</u> </p>	<p style="text-align: center;">– corrigenda (correct references)</p>