Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2025 Amendment 2)

Object of Amendment

Rules for the Survey and Construction of Steel Ships Parts A and C

Reason for Amendment

Part C of the Rules and Guidance for the Survey and Construction of Steel Ships was revised comprehensively in July 2022, and there are plans to continuously review it with the aim of improving its practicality and usability based on various feedback from relevant industry members.

Additionally, insights gained through research and development will be appropriately reflected in Part C to enhance safety and rationality.

Accordingly, relevant requirements are amended to reflect rule review results and research and development outcomes.

Outline of Amendment

(1) Revises the notation "*PrimeShip-Fatigue Assessment - Direct Load Analysis* (*PS-FA-DLA*)" assigned when fatigue strength assessment is performed based on loads obtained by direct load analysis so that the wave loads considered and the design fatigue life are to be clearly stated.
(2) Specifies alternative formulae for calculating the dynamic pressure within tanks located in machinery spaces, etc.
(3) Specifies the requirement related to the omission of docking brackets.
(4) Amends the strength assessment method for the lower parts of corrugated bulkheads used in cargo hold analysis for tankers based on that used in CSR-B&T.
(5) Specifies requirements for the local strength assessment of transverse swash bulkheads and stiffeners in independent prismatic tanks for ships carrying liquefied gas in bulk.
(6) Specifies additional loads to be considered in local strength assessment of inner hull members of membrane tanks of ships carrying liquefied gas in bulk

Effective Date and Application

1. This amendment applies to ships for which the date of contract for construction is on or after 1 January 2027.
2. Notwithstanding the preceding 1, this draft amendment may apply, upon request, to ships for which the date of contract for construction is before the effective date.

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An asterisk (*) after the title of a requirement indicates that there is also relevant information in the corresponding Guidance.

ID:DH25-11

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2025 Amendment 2))

Amended	Original	Remarks
RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS **Part A GENERAL RULES** **Chapter 1 GENERAL** **1.2 Class Notations** **1.2.6 Application of Hull Structural Analysis** The class notations indicated below in **(1)** to **(4)** are added to classification characters for ships for which direct strength calculations and/or fatigue strength assessments are carried out by a method approved by the Society for determining structural scantlings or structural details. (1) Where the strength assessment by cargo hold analysis are carried out in accordance with the relevant requirements in **Chapter 8, Part 1** or **Part 2, Part C**: *PrimeShip-Direct Assessment* (abbreviated to *PS-DA*) (2) Where the fatigue strength assessment by finite element analysis are carried out in accordance with the relevant requirements in **Chapter 9, Part 1** or **Part 2, Part C**: *PrimeShip-Fatigue Assessment* (abbreviated to *PS-FA*) In addition, an appropriate additional notation corresponding to the wave load and the design fatigue life T_{DF} to be considered is affixed as follows.	**RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS** **Part A GENERAL RULES** **Chapter 1 GENERAL** **1.2 Class Notations** **1.2.6 Application of Hull Structural Analysis** The class notations indicated below in **(1)** to **(4)** are added to classification characters for ships for which direct strength calculations and/or fatigue strength assessments are carried out by a method approved by the Society for determining structural scantlings or structural details. (1) Where the strength assessment by cargo hold analysis are carried out in accordance with the relevant requirements in **Chapter 8, Part 1** or **Part 2, Part C**: *PrimeShip-Direct Assessment* (abbreviated to *PS-DA*) (2) Where the fatigue strength assessment by finite element analysis are carried out in accordance with the relevant requirements in **Chapter 9, Part 1** or **Part 2, Part C**: *PrimeShip-Fatigue Assessment* (abbreviated to *PS-FA*) In addition, an appropriate additional notation corresponding to the wave load and the design fatigue life T_{DF} to be considered is affixed as follows.	

DRAFT

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2025 Amendment 2))

Amended	Original	Remarks
(a) Where the fatigue strength assessment by using the worldwide loads *PrimeShip-Fatigue Assessment (World Wide, T_{DF})* (abbreviated to *PS-FA_(WW, T_{DF})*) (b) Where the fatigue strength assessment by using the North Atlantic Ocean load *PrimeShip-Fatigue Assessment (North Atlantic, T_{DF})* (abbreviated to *PS-FA_(NA, T_{DF})*) Where the fatigue strength assessment is carried out in accordance with the provisions of **9.2.1.1-2, Part 2-9, Part C**, the notation of "-*Superior*" (abbreviated to -*S*) is added. (e.g. *PS-FA-S(WW, T_{DF})*)	(a) Where the fatigue strength assessment by using the worldwide loads *PrimeShip-Fatigue Assessment (World Wide, T_{DF})* (abbreviated to *PS-FA(WW, T_{DF})*) (b) Where the fatigue strength assessment by using the North Atlantic Ocean load *PrimeShip-Fatigue Assessment (North Atlantic, T_{DF})* (abbreviated to *PS-FA(NA, T_{DF})*) Where the fatigue strength assessment is carried out in accordance with the provisions of **9.2.1.1-2, Part 2-9, Part C**, the notation of "-*Superior*" (abbreviated to -*S*) is added. (e.g. *PS-FA-S(WW, T_{DF})*)	
(3) Where the yield strength assessments and buckling strength assessments of primary members in all cargo spaces are carried out based upon direct load analysis and direct strength calculations deemed appropriate by the Society using individual design regular waves obtained from direct load analysis in accordance with **1.1.2.4-3 (1)** or **(2), Part 1, Part C**: *PrimeShip-Direct Assessment-Direct Load Analysis* (abbreviated to *PS-DA-DLA*)	(3) Where the yield strength assessments and buckling strength assessments of primary members in all cargo spaces are carried out based upon direct load analysis and direct strength calculations deemed appropriate by the Society using individual design regular waves obtained from direct load analysis in accordance with **1.1.2.4-3 (1)** or **(2), Part 1, Part C**: *PrimeShip-Direct Assessment-Direct Load Analysis* (abbreviated to *PS-DA-DLA*)	
(4) Where the fatigue strength assessment of structural details of primary members in all cargo spaces that are deemed necessary by the Society are carried out based upon direct strength calculations using loads obtained from direct load analysis in accordance with **1.1.2.4-3(1), (2)** or **(5), Part 1, Part C**: *PrimeShip-Fatigue Assessment-Direct Load Analysis* (abbreviated to *PS-FA-DLA*) In addition, appropriate additional notation corresponding to the wave load and the design fatigue life T_{DF} to be considered is affixed as follows.	(4) Where the fatigue strength assessment of structural details of primary members in all cargo spaces that are deemed necessary by the Society are carried out based upon direct strength calculations using loads obtained from direct load analysis in accordance with **1.1.2.4-3(1), (2)** or **(5), Part 1, Part C**: *PrimeShip-Fatigue Assessment-Direct Load Analysis (abbreviated to PS-FA-DLA)*	Amendment (1) Revises the statement of the notation "*PrimeShip-Fatigue Assessment - Direct Load Analysis*

DRAFT

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2025 Amendment 2))

Amended	Original	Remarks
(a) For fatigue strength assessment using worldwide loads *PrimeShip-Fatigue Assessment-Direct Load Analysis (World Wide, T_{DF})* (abbreviated to *PS-FA-DLA (WW, T_{DF})*) (b) For fatigue strength assessment using North Atlantic Ocean loads *PrimeShip-Fatigue Assessment-Direct Load Analysis (North Atlantic, T_{DF})* (abbreviated to *PS-FA-DLA (NA, T_{DF})*)		(*PS-FA-DLA*)" assigned when fatigue strength assessment is performed based on loads obtained by direct load analysis so that the wave loads considered and the design fatigue life are to be clearly stated.

DRAFT

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2025 Amendment 2))

Amended	Original	Remarks
RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS **Part C HULL CONSTRUCTION AND EQUIPMENT** **Part 1 GENERAL HULL REQUIREMENTS** **Chapter 4 LOADS** **4.4 Loads to be Considered in Local Strength** **4.4.2 Maximum Load Condition** **4.4.2.4 Internal Pressure due to Liquid Loaded** (Omitted) **2** Dynamic pressure P_{ld} (kN/m^2) acting on tanks and ballast holds loaded with liquids is to be as specified in **Table 4.4.2-8**.	**RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS** **Part C HULL CONSTRUCTION AND EQUIPMENT** **Part 1 GENERAL HULL REQUIREMENTS** **Chapter 4 LOADS** **4.4 Loads to be Considered in Local Strength** **4.4.2 Maximum Load Condition** **4.4.2.4 Internal Pressure due to Liquid Loaded** (Omitted) **2** Dynamic pressure P_{ld} (kN/m^2) acting on tanks and ballast holds loaded with liquids is to be as specified in **Table 4.4.2-8**.	

Table 4.4.2-8 Dynamic Pressure P_{ld} Acting in Tanks or Ballast Holds Loaded with Liquids

Type of loaded compartment	Dynamic pressure P_{ld} (kN/m^2)[(1)(2)]	
	$z \leq z_{top}$	$z > z_{top}$
Cargo tanks fully loaded with liquid cargo including liquefied gas, ballast	$\rho_L\sqrt{[C_{WDx}a_{Xe-l}(x_{TG}-x)]^2+\left[C_{WDy}a_{Ye-l}(y_{TG}-y)\right]^2+[C_{WDz}a_{Ze-l}(z_0-z)]^2}$	0

Amendment (2)
Specifies alternative formulae for calculating dynamic pressure in tanks within the machinery space, etc.

DRAFT

Amended	Original	Remarks

holds and liquefied gas fuel tanks		
Others (e.g. ballast tanks)(6)	$\rho_L\sqrt{[C_{WDx}a_{Xe-l}(x_0-x)]^2+\left[C_{WDy}a_{Ye-l}(y_0-y)\right]^2+[C_{WDz}a_{Ze-l}(z_0-z)]^2}$	0

Notes:

ρ_L: As specified in **Table 4.4.2-6**

C_{WDx}: Coefficient for load condition to be taken as:

For *HF*, $C_{WDx}=0.86$

For *RP*, $C_{WDx}=0.0$

C_{WDy}: Coefficient for load condition to be taken as:

For *HF*, $C_{WDy}=0.0$

For *RP*, $C_{WDy}=1.0$

C_{WDz}: Coefficient for load condition to be taken as:

In *HF*,

For $0.0\le x_{CWD}/L_C\le 0.3, C_{WDz}=-2.73\frac{x_{CWD}}{L_C}+1.0$

For $0.3< x_{CWD}/L_C\le 0.7, C_{WDz}=2.05\frac{x_{CWD}}{L_C}-0.435$

For $0.7< x_{CWD}/L_C\le 1.0, C_{WDz}=1.0$

In *RP*,

For $0.0\le x_{CWD}/L_C\le 0.3, C_{WDz}=1.37\frac{x_{CWD}}{L_C}+0.59$

For $0.3< x_{CWD}/L_C\le 0.7, C_{WDz}=1.0$

For $0.7< x_{CWD}/L_C\le 1.0, C_{WDz}=-1.27\frac{x_{CWD}}{L_C}+1.89$

x_{CWD}: *X* coordinate (*m*) at the calculation point for the coefficient for the load condition, to be taken as the *X* coordinate (*m*) at the volumetric centre of gravity of the tank or ballast hold under consideration

$a_{Xe-l}, a_{Ye-l}, a_{Ze-l}$: Envelope acceleration (m/s^2) in the longitudinal, transverse and vertical directions at the volumetric centre of gravity of the tank or ballast hold under consideration, to be calculated in accordance with the requirements in **4.2.4.1**(3)(4)

x_{TG}, y_{TG}: *X* and *Y* coordinates (*m*) at the volumetric centre of gravity of the tank or ballast hold under consideration

x_0, y_0, z_0: *X*, *Y*, and *Z* coordinates (*m*) of the reference point(5)

z_{top}: As specified in **Table 4.4.2-5**

(1) In the range of $x/L_C<0.0$, to be taken as $x/L_C=0.0$

(2) In the range of $x/L_C>1.0$, to be taken as $x/L_C=1.0$

(3) Where the types of loaded compartments are cargo tanks fully loaded with liquid cargo (including liquefied gas) and ballast holds, the values of K_{xx}, GM, etc. may be calculated by the following formulae in order to obtain the

Adds note (6) regarding alternative formulae for calculating dynamic pressure in tanks within the machinery space, etc.

Clarifies the calculation point for the coefficient for load condition C_{WDz}.

DRAFT

Amended	Original	Remarks
envelope accelerations to be used for the dynamic pressure. However, GM is not to be less than $0.002B^2$. When the values are specified in the relevant requirements of **Part 2**, the values are to be in accordance with the requirements of **Part 2**. $K_{xx} = 0.38B$ $GM = \frac{T_{LC}}{2} + \frac{B^2}{T_{LC}C_{B\_LC}}\frac{3C_{W\_LC} - 1}{24} - z_G$ $T_{LC} = \frac{1}{n_{CH}}T_{SC} + \frac{n_{CH} - 1}{n_{CH}}T_{BAL}$ $z_G = \left(0.05\frac{1}{n_{CH}} + 0.2\right)\frac{B}{C_{B\_LC}}$ n_{CH}: Total number of cargo holds (4) Where the type of loaded compartment is others (e.g. ballast tank), the values of K_{xx}, GM, etc. may be calculated by the following formulae in order to obtain the envelope accelerations to be used for dynamic pressure. However, GM is not to be less than $0.002B^2$. When the values are specified in the relevant requirements of **Part 2**, the value are to be in accordance with the requirements of **Part 2**. $K_{xx} = 0.40B$ $GM = \frac{T_{LC}}{2} + \frac{B^2}{T_{LC}C_{B\_LC}}\frac{3C_{W\_LC} - 1}{24} - z_G$ $T_{LC} = T_{BAL}$ $z_G = 0.2\frac{B}{C_{B\_LC}}$ (5) The reference point is to be taken as the point with the highest value of V_j, calculated for all points that define the upper boundary of the tank or the ballast hold excluding the points located at the height equal to or below the volumetric centre of gravity of the said tank and hold. $V_j = C_{WDx}a_{Xe-l}\lvert x_j - x\rvert + C_{WDy}a_{Ye-l}\lvert y_j - y\rvert + C_{WDz}a_{Ze-l}\lvert z_j - z\rvert + g(z_j - z)$ x_j, y_j, z_j: X, Y and Z coordinates of point j (m) on the upper boundary of the tank or the ballast hold excluding the points located at the height equal to or below the volumetric centre of gravity of the said tank and hold (6) P_{ld} may be calculated using the following formulae: $P_{ld} = \rho_L\sqrt{(C_{WDx}a_{Xe-l}\ell_{tk})^2 + \left(C_{WDy}a_{Ye-l}b_{tk}\right)^2 + (C_{WDz}a_{Ze-l}h_{tk})^2}$ for $z \le z_{top}$ $P_{ld} = 0$ for $z > z_{top}$ ℓ_{tk}: Maximum tank length (m) b_{tk}: Maximum tank breadth (m) h_{tk}: Maximum tank height (m)		Specifies alternative formulae for calculating dynamic pressure in tanks within the machinery space, etc. that are easy to use and yield uniform values throughout the tank.

DRAFT

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2025 Amendment 2))

<table>
<tr><th>Amended</th><th>Original</th><th>Remarks</th></tr>
<tr><td>

4.4.2.5 Internal Pressure due to Dry Bulk Cargo

(Omitted)

2 Dynamic pressure P_{bd} (kN/m^2) acting on cargo holds loaded with dry bulk cargo is to be as specified in **Table 4.4.2-11**.

</td><td>

4.4.2.5 Internal Pressure due to Dry Bulk Cargo

(Omitted)

2 Dynamic pressure P_{bd} (kN/m^2) acting on cargo holds loaded with dry bulk cargo is to be as specified in **Table 4.4.2-11**.

</td><td></td></tr>
<tr><td colspan="3">

Table 4.4.2-11 Dynamic Pressure P_{bd} in Cargo Hold Loaded with Dry Bulk Cargo

<table>
<tr><th>Position under consideration</th><th>Dynamic pressure P_{bd} (kN/m^2)(1)</th></tr>
<tr><td>$z \le z_C$</td><td>$\rho_C\sqrt{(C_{WDx}C_{bx}a_{Xe-b}x_b)^2 + \left(C_{WDy}C_{by}a_{Ye-b}y_b\right)^2+(C_{WDz}C_{bz}K_C a_{Ze-b}z_b)^2}$</td></tr>
<tr><td>$z > z_C$</td><td>0</td></tr>
<tr><td colspan="2">(Omitted)
$C_{WDx}, C_{WDy}, C_{WDz}$: Coefficients for load conditions obtained from the formulae specified in Table 4.4.2-8. In this case, the X coordinate (m) at the calculation point for the coefficient for load condition x_{CWD} is to be taken as the X coordinate (m) at volumetric centre of gravity of the cargo hold under consideration.
(Omitted)</td></tr>
</table>

</td><td>Clarifies the calculation point for the coefficient for load condition C_{WDz}.</td></tr>
<tr><td>

4.4.2.7 Internal Pressure due to Cargoes, Stores or Other Equipment Loaded on Deck

2 Dynamic pressure P_{dkd} (kN/m^2) due to cargoes, stores or other equipment loaded on deck is to be in accordance with the following formula:

$$P_{dkd} = C_{WDz}P_{dks}\frac{a_{Ze}}{g}$$

C_{WDz}: Coefficient for the load condition obtained from the formula specified in **Table 4.4.2-8**. In this case, the *X* coordinate (*m*) at the calculation point for the coefficient for load condition x_{CWD} is to be taken as the *X* coordinate (*m*) at the mid-length in the longitudinal direction of the cargo hold.

(Omitted)

</td><td>

4.4.2.7 Internal Pressure due to Cargoes, Stores or Other Equipment Loaded on Deck

2 Dynamic pressure P_{dkd} (kN/m^2) due to cargoes, stores or other equipment loaded on deck is to be in accordance with the following formula:

$$P_{dkd} = C_{WDz}P_{dks}\frac{a_{Ze}}{g}$$

C_{WDz}: As specified in **Table 4.4.2-8**

(Omitted)

</td><td>Clarifies the calculation point for the coefficient for load condition C_{WDz}.</td></tr>
</table>

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Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2025 Amendment 2))

Amended	Original	Remarks
Chapter 10 ADDITIONAL STRUCTURAL REQUIREMENTS **10.2 Bottom Structure** **10.2.2 Girders and Floors** **10.2.2.1 Reinforcement for Docking*** **1** The bottom structure is to have adequate strength to withstand the reaction force from the blocks in docking. **2** For ships with longitudinal framing system, docking brackets are to be provided at the appropriate space to the centre girder between the floors as reinforcement for docking. Such brackets are to be provided so as to reach the adjacent bottom longitudinals and are to be connected to the centre girders, bottom shell plating, and bottom longitudinals. However, the installation of such brackets may be omitted provided that a detailed assessment is carried out, taking into consideration factors such as the arrangement of the blocks in docking. In such cases, the Society may require the submission of detailed assessment documents. **3** The thickness of the brackets in **-2** above is not to be less than that obtained from the following formula. However, the thickness need not be greater than the net offered thickness of the adjacent floor. $t = 0.6\sqrt{L_C}\ (mm)$	**Chapter 10 ADDITIONAL STRUCTURAL REQUIREMENTS** **10.2 Bottom Structure** **10.2.2 Girders and Floors** **10.2.2.1 Reinforcement for Docking*** **1** The bottom structure is to have adequate strength to withstand the reaction force from the blocks in docking. **2** For ships with longitudinal framing system, docking brackets are to be provided at the appropriate space to the centre girder between the floors as reinforcement for docking. Such brackets are to be provided so as to reach the adjacent bottom longitudinals and are to be connected to the centre girders, bottom shell plating, and bottom longitudinals. **3** The thickness of the brackets in **-2** above is not to be less than that obtained from the following formula. However, the thickness need not be greater than the net offered thickness of the adjacent floor. $t = 0.6\sqrt{L_C}\ (mm)$	Amendment (3) Specifies the requirement related to the omission of brackets.

DRAFT

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2025 Amendment 2))

Amended	Original	Remarks
Part 2-5 GENERAL CARGO SHIPS AND REFRIGERATED CARGO SHIPS **Chapter 4 LOADS** **4.4 Loads to be Considered in Additional Structural Requirements** **4.4.2 Maximum Load Condition** **4.4.2.1 Steel Coils** **2** The total load F_{SC} (kN) of the steel coil acting on the hull is to be calculated by the following formula. However, it is not to be less than 0. $F_{SC} = F_{SCs} + F_{SCd}$ F_{SCs}: Static load (kN), as specified in **Table 4.4.2-2**. F_{SCd}: Dynamic load (kN), as specified in **Table 4.4.2-3**.	**Part 2-5 GENERAL CARGO SHIPS AND REFRIGERATED CARGO SHIPS** **Chapter 4 LOADS** **4.4 Loads to be Considered in Additional Structural Requirements** **4.4.2 Maximum Load Condition** **4.4.2.1 Steel Coils** **2** The total load F_{SC} (kN) of the steel coil acting on the hull is to be calculated by the following formula. However, it is not to be less than 0. $F_{SC} = F_{SCs} + F_{SCd}$ F_{SCs}: Static load (kN), as specified in **Table 4.4.2-2**. F_{SCd}: Dynamic load (kN), as specified in **Table 4.4.2-3**.	

DRAFT

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2025 Amendment 2))

Amended	Original	Remarks

Table 4.4.2-3 Dynamic Load F_{SCd}

Members	Load in waves F_{SCd} (kN)	
Inner bottoms	$\frac{F_{SCs}}{g} C_{WDz} a_{Ze-SC}$	
Bilge hopper plating	Case 1	$\frac{F_{SCs}}{g} C_{WDz} a_{Ze-SC} \cdot \cos\alpha$
	Case 2	$C_{SC3} W_{SC} \frac{n_1 n_2}{n_3} g \sin\theta \cdot \cos\left(\min\left(\frac{\pi}{2} - \alpha, \frac{\pi}{4}\right)\right)$
Longitudinal bulkheads	$n_2 \leq 10$ and $n_3 \leq 5$	$C_{SC3} W_{SC} \frac{n_1 n_2}{n_3} g \sin\theta$
	$n_2 > 10$ or $n_3 > 5$	$C_{SC3} W_{SC} n_1 \frac{\ell}{\ell_{st}} g \sin\theta$
Side frames	$C_{SC3} W_{SC} \frac{n_1}{n_4} g \sin\theta$	

Notes:
C_{WDz}: Coefficient for the load condition obtained from the formula specified in **Table 4.4.2-8, Part 1**. In this case, the X coordinate (m) at the calculation point for the coefficient for load condition x_{CWD} is to be taken as the X coordinate (m) at volumetric centre of gravity of the cargo hold under consideration.
(Omitted)

Amendment (2)
Clarifies the calculation point for the coefficient for load condition C_{WDz}.

DRAFT

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2025 Amendment 2))

Amended	Original	Remarks
Part 2-6 VEHICLES CARRIERS AND ROLL-ON/ROLL-OFF SHIPS **Chapter 4 LOADS** **4.7 Loads to be Considered in Additional Structural Requirements** **4.7.2 Maximum Load Condition** **4.7.2.1 Load Acting on the Car Deck and Movable Car Deck** **1** The concentrated loads due to the wheels of the vehicle are to be considered as loads for car decks on the stiffeners attached to the car decks, in accordance with the following formula. $P_{CDK} = P_{Wh-max} \cdot (1 + C_{CDK})$ P_{Wh-max}: Designed maximum wheel load (kN). When the wheel load is given in units of t, multiply this value by 9.81. C_{CDK}: As given by the following formula: $C_{CDK} = C_{WDz} \frac{a_{Ze-CDK}}{g}$ C_{WDz}: Coefficient for the load condition obtained from the formula specified in **Table 4.4.2-8, Part 1**. In this case, the X coordinate (m) at the calculation point for the coefficient for load condition x_{CWD} is to be taken as the X coordinate (m) at the centre of the distance	**Part 2-6 VEHICLES CARRIERS AND ROLL-ON/ROLL-OFF SHIPS** **Chapter 4 LOADS** **4.7 Loads to be Considered in Additional Structural Requirements** **4.7.2 Maximum Load Condition** **4.7.2.1 Load Acting on the Car Deck and Movable Car Deck** **1** The concentrated loads due to the wheels of the vehicle are to be considered as loads for car decks on the stiffeners attached to the car decks, in accordance with the following formula. $P_{CDK} = P_{Wh-max} \cdot (1 + C_{CDK})$ P_{Wh-max}: Designed maximum wheel load (kN). When the wheel load is given in units of t, multiply this value by 9.81. C_{CDK}: As given by the following formula: $C_{CDK} = C_{WDz} \frac{a_{Ze-CDK}}{g}$ C_{WDz}: Coefficient related to load condition, as specified in **Table 4.4.2-8, Part 1**.	Amendment (2) Clarifies the calculation point for the coefficient for load condition C_{WDz}.

DRAFT

Amended	Original	Remarks
between the support points for stiffeners on the car deck being considered. a_{Ze-CDK}: Envelope acceleration (m/s^2) in the vertical direction at the centre line of the car deck under consideration, obtained from the formula specified in **4.2.4.1, Part 1**. In this case, $T_{LC} = T_{SC}$ and $\theta = a_4 = 0$. Further, the centre of gravity in the longitudinal direction of the car deck under consideration is taken as the centre of the distance between support points for stiffeners on the car deck accounted for.	a_{Ze-CDK}: Envelope acceleration (m/s^2) in the vertical direction at the centre line of the car deck under consideration, obtained from the formula specified in **4.2.4.1, Part 1**. In this case, $T_{LC} = T_{SC}$ and $\theta = a_4 = 0$. Further, the centre of gravity in the longitudinal direction of the car deck under consideration is taken as the centre of the distance between support points for stiffeners on the car deck accounted for.	
Part 2-7 TANKERS	**Part 2-7 TANKERS**	
Chapter 8 STRENGTH ASSESSMENT BY CARGO HOLD ANALYSIS	**Chapter 8 STRENGTH ASSESSMENT BY CARGO HOLD ANALYSIS**	
8.5 Strength Assessments	**8.5 Strength Assessments**	
8.5.1 Yield Strength Assessments	**8.5.1 Yield Strength Assessments**	
8.5.1.1 Reference Stress **1** In applying **8.6.1.1, Part 1**, the averaged stresses of multiple elements within the range deemed appropriate by the Society may be taken as the reference stress for locations where the mesh size specified in **8.3.1.2** is applied. A range for which the web depth of the vertically corrugated bulkhead is	**8.5.1.1 Reference Stress** **1** In applying **8.6.1.1, Part 1**, the averaged stresses of multiple elements within the range deemed appropriate by the Society may be taken as the reference stress for locations where the mesh size specified in **8.3.1.2** is applied. A range for which the web depth of the vertically corrugated bulkhead is	Amendment (4) Revises of the strength assessment method for the lower part of corrugated bulkheads in cargo hold analysis of tankers.

DRAFT

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2025 Amendment 2))

Amended	Original	Remarks
divided into two parts (that is, approximately 500 *mm* × 500 *mm*) is to be taken as the standard range. **2** In applying **-1** above, stress is not to be averaged across structural discontinuities. **3** In applying **8.6.1.2, Part 1**, notwithstanding **3.2.1.4-1, Part 1**, 0.78 is to be used as the lower limit of the material factor *K* for stainless steels or stainless clad steels when determining the construction and scantlings for areas of anticipated stress concentration, such as the connections of the lower corner parts of corrugated bulkheads and inner bottom plates or the top plates of lower stools, the connections of inner bottom plates and bilge hopper plates or lower stools, etc. This requirement, however, need not be applied when fatigue strength assessments based upon hot spot stress obtained by finite element analysis are carried out, and the results are submitted to the Society for approval.	divided into three parts (that is, approximately 300 *mm* × 300 *mm*) is to be taken as the standard range. **2** In applying **-1** above, stress is not to be averaged across structural discontinuities.	Amends the averaging range is revised so that it is in line with the assessment method used in CSR-B&T. Specifies the lower limit of the material factor K is to be taken as 0.78 in case where fatigue strength assessments are not carried out, when stainless steels or stainless clad steels are used for areas of anticipated stress concentration, such as the lower parts of corrugated bulkheads.

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Amended	Original	Remarks
Part 2-9 SHIPS CARRYING LIQUEFIED GASES IN BULK (INDEPENDENT PRISMATIC TANKS TYPE A/B)	**Part 2-9 SHIPS CARRYING LIQUEFIED GASES IN BULK (INDEPENDENT PRISMATIC TANKS TYPE A/B)**	
Chapter 10 ADDITIONAL STRUCTURAL REQUIREMENTS	**Chapter 10 ADDITIONAL STRUCTURAL REQUIREMENTS**	
10.2 Bulkhead Structure	**(Newly Added)**	
10.2.1 General	**(Newly Added)**	
10.2.1.1 Application The requirements in **10.2** apply to the bulkhead plating of transverse swash bulkheads in independent prismatic tanks and to the stiffeners attached to such bulkheads.	**(Newly Added)**	
10.2.2 Scantlings of Transverse Swash Bulkheads	**(Newly Added)**	
10.2.2.1 Bulkhead Plating The minimum gross thickness of the bulkhead plating of transverse swash bulkheads in independent prismatic tanks is to be not less than that obtained from the following formula. $t_{gr} = \sqrt{\frac{4}{1.15\sigma_Y}}\sqrt{\frac{P_{sw}b^2}{12}} \times 10^{-3}\ (mm)$ σ_Y: Specified minimum yield stress (N/mm^2) b: Length (mm) of the shorter side of the plate panel P_{sw}: Minimum pressure (kN/m^2) acting on the transverse swash bulkhead is to be obtained from	**(Newly Added)**	Amendment (5) Specifies requirements for the local strength assessment of transverse swash bulkheads and stiffeners in independent prismatic tanks for ships carrying liquefied gas in bulk. Based on the previous Part N prior to the comprehensive revision

DRAFT

Amended	Original	Remarks
the following formula. $P_{sw} = 5.6\rho_c g$ ρ_c: Design cargo density (t/m^3) of liquefied gas		of Part C (N4.21.3-2(5), Guidance for Survey and Construction of Steel Ships Part N, 2022), specifies the formula for calculating the minimum required plate thickness.
10.2.2.2 Stiffeners The gross section modulus of the stiffeners attached to the transverse swash bulkheads in independent prismatic tanks is to be not less than that obtained from the following formula. $Z_{gr} = \frac{f_{bdg} P_{sw} s \ell^2}{12\sigma_{allow}} \quad (cm^3)$ σ_{allow}: $\sigma_Y/1.33$ or $\sigma_B/2.66$, whichever is less, where σ_B is the specified minimum tensile strength (N/mm^2) at room temperature, as specified in **8.5.1.1-2**. ℓ: Full length (m) of the stiffener s: Spacing (mm) of stiffeners f_{bdg}: Factor according to the type of end connection of stiffeners as specified in **Table 6.4.2-2, Part 1**. P_{sw}: As specified in **10.2.2.1**.	**(Newly Added)**	Amendment (5) Specifies requirements for the local strength assessment of transverse swash bulkheads and stiffeners in independent prismatic tanks for liquefied gas bulk carriers Based on the previous Part N prior to the comprehensive revision of Part C (N4.21.3-2(5), Guidance for Survey and Construction of Steel Ships Part N, 2022), specifies the formula for calculating the section modulus.

DRAFT

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2025 Amendment 2))

Amended	Original	Remarks
Part 2-11 SHIPS CARRYING LIQUEFIED GASES IN BULK (MEMBRANE TANKS) **Chapter 1 GENERAL** **1.2 Definitions** **1.2.1 Terms** **1.2.1.1 Definition of Terms** **1** "Membrane tanks" are non-self-supporting tanks that consist of a thin liquid and gastight layer (membrane) supported through insulation by the adjacent hull structure. **2** "System designers" means the designers of membrane cargo containment systems. **3** "Inner hull structural members" means inner deck plating, longitudinal bulkhead plating, bilge hopper plating, inner bottom plating and transverse bulkhead plating.	**Part 2-11 SHIPS CARRYING LIQUEFIED GASES IN BULK (MEMBRANE TANKS)** **Chapter 1 GENERAL** **1.2 Definitions** **1.2.1 Terms** **1.2.1.1 Definition of Terms** **1** "Membrane tanks" are non-self-supporting tanks that consist of a thin liquid and gastight layer (membrane) supported through insulation by the adjacent hull structure. **2** "System designers" means the designers of membrane cargo containment systems.	Amendment (6) Specifies additional loads to be considered in local strength assessment of inner hull members of membrane tanks for ships carrying liquefied gas in bulk

DRAFT

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2025 Amendment 2))

Amended	Original	Remarks
Chapter 4 LOADS **4.2 Loads to be Considered in Local Strength** **4.2.1 General** **4.2.1.1 General** **1** The loads to be considered in the requirements of local strength specified in **Chapter 6** and **Chapter 6, Part 1** are to be in accordance with the requirements of **4.2**. **2** Additional requirements for loads in the maximum load condition are to be in accordance with the requirements of **4.2.2**. **3** The loads to be considered for inner hull structural members are to be in accordance with the requirements of **4.2.3**. **4.2.2 Maximum Load Condition** **4.2.2.1 Lateral Loads** **1** In applying **4.4.2.4, Part 1**, the parameters (GM, z_G, etc.) required to calculate the dynamic pressure due to cargo are to be the values in the loading condition that cargo is loaded only in the cargo hold to be considered and the draught is at a minimum (e.g. one-tank-loaded condition). The radius of gyration (m) around *x-axis* is to be taken as $0.38B$, but a value calculated based upon the weight distribution according to the loading condition to be considered may be used. **2** In applying **4.4.2.4, Part 1**, the parameters (GM, z_G, etc.) required to calculate the dynamic pressure due to ballast water are to be the values in the ballast condition. The same	**Chapter 4 LOADS** **4.2 Loads to be Considered in Local Strength** **4.2.1 General** **4.2.1.1 General** **1** The loads to be considered in the requirements of local strength specified in **Chapter 6** and **Chapter 6, Part 1** are also to be in accordance with the requirements of **4.2**. **2** Additional requirements for loads in the maximum load condition are to be in accordance with the requirements of **4.2.2**. **4.2.2 Maximum Load Condition** **4.2.2.1 Lateral Loads** **1** In applying **4.4.2.4, Part 1**, the parameters (GM, z_G, etc.) required to calculate the dynamic pressure due to cargo are to be the values in the loading condition that cargo is loaded only in the cargo hold to be considered and the draught is at a minimum (e.g. one-tank-loaded condition). The radius of gyration (m) around *x-axis* is to be taken as $0.38B$, but a value calculated based upon the weight distribution according to the loading condition to be considered may be used. **2** In applying **4.4.2.4, Part 1**, the parameters (GM, z_G, etc.) required to calculate the dynamic pressure due to ballast water are to be the values in the ballast condition. The same	

DRAFT

Amended	Original	Remarks
parameters are to be applied where the dynamic pressure due to liquid other than ballast water, such as the pressure due to a fuel oil tank, is calculated.	parameters are to be applied where the dynamic pressure due to liquid other than ballast water, such as the pressure due to a fuel oil tank, is calculated.	
4.2.3 Loads to be Considered for Inner Hull Structural Members	**(Newly Added)**	
4.2.3.1 When evaluating the local strength of inner hull structural members, the following loads P_{in1} and P_{in2} (kN/m^2) are to be additionally considered. However, P_{in1} is to be considered only where P_h is set as specified in **4.13.2-3, Part N**. $P_{in1} = P_{ls\_1}/0.95$ $P_{in2} = P_{heel}$ P_{ls_1}: Static pressure and design vapour pressure in harbour condition (kN/m^2). As for P_{ls} specified in **4.4.2.4, Part 1**, it is the value obtained by replacing the design vapour pressure with P_h specified in **4.13.2-3, Part N**. P_{heel}: Maximum static pressure in 30-*degree* static heel condition (kN/m^2)	**(Newly Added)**	The load scenarios and loads to be considered are the same as those for local strength assessment of independent prismatic tanks, except for hull girder stress.

DRAFT

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2025 Amendment 2))

Amended	Original	Remarks
Chapter 6 LOCAL STRENGTH	**(Newly Added)**	
6.1 Inner Hull Structural Members	**(Newly Added)**	
6.1.1 General	**(Newly Added)**	
6.1.1.1 Application The scantlings of the plates and stiffeners of inner hull structural members which are subject to internal pressures due to liquid cargoes in cargo holds are to be in accordance with **6.1** in addition to **Part 1**.	**(Newly Added)**	
6.1.2 Design Load Scenarios and Applied Loads for Assessment Target Members	**(Newly Added)**	
6.1.2.1 The design load scenarios and applied loads for assessment target members/compartments are to be in accordance with **Table 6.1.2-1**.	**(Newly Added)**	

DRAFT

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2025 Amendment 2))

<table>
<tr><th>Amended</th><th>Original</th><th>Remarks</th></tr>
<tr><td colspan="2">
Table 6.1.2-1 Design Load Scenarios and Applied Loads for Assessment Target Members/ Compartments
<table>
<tr><th rowspan="3">Members/ compartments to be assessed</th><th rowspan="3">Design load scenario</th><th colspan="4">Applied load</th></tr>
<tr><th rowspan="2">Lateral load</th><th rowspan="2">Load type</th><th rowspan="2">Load component</th><th colspan="2">Reference</th></tr>
<tr><th>Lateral load (P)</th><th>Hull girder load (M_{V-HG} and M_{H-HG})</th></tr>
<tr><td>Inner hull structural members</td><td>Harbour condition</td><td>Internal pressure</td><td>Liquid cargo</td><td>Static loads</td><td>P_{in1} in 4.2.3.1</td><td>M_{PT}</td></tr>
<tr><td>Inner hull structural members</td><td>30-degree static heel condition</td><td>Internal pressure</td><td>Liquid cargo</td><td>Static loads</td><td>P_{in2} in 4.2.3.1</td><td>-</td></tr>
<tr><td colspan="7">Notes:
M_{PT} is to be taken as the greater absolute value of M_{PT_max} and M_{PT_min}.</td></tr>
</table>
</td><td></td></tr>
<tr><td><u>6.1.3 Plates and Stiffeners</u>

<u>6.1.3.1</u>
<u>Plates and stiffeners of inner hull structural members are to satisfy the requirements for the maximum load condition of 6.3 and 6.4, Part 1 respectively for the design load scenarios specified in Table 6.1.2-1. In such cases, applied loads are to be in accordance with Table 6.1.2-1, instead of the loads specified in Table 6.3.2-1 and Table 6.4.2-5, Part 1.</u></td><td>(Newly Added)

(Newly Added)</td><td></td></tr>
<tr><td colspan="2">EFFECTIVE DATE AND APPLICATION

1. Effective date of this amendment is 1 January 2027.
2. Notwithstanding the amendments, the current requirements apply to ships for which the date of contract for construction is before the effective date.
3. Notwithstanding the provision of preceding 2., the amendments may apply to ships for which the date of contract for construction is before the effective date upon requests.</td><td></td></tr>
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