Amendments of the Rules / Guidance

(Internal opinion inquiry)

Pt. 3 Ship Structure

2023. 9

Hull Rule Development Team

Main Amendments

(1) Background of Amendment

1) HUT4000-3062-2022 : still water bending moment for buckling strength assessement
2) MKP4700-2-2023 : requirements of cofferdam
3) EAT4700-1947-2023 : remote controls of passenger ships
4) ULS3000-69-2023 : hull construction monitoring procedure
5) Deep tanks : requirements of bulkhead plates

(2) Effective date : ships contracted for construction on or after 1 July 2024

Present	Amendment	Note
⟨Rules⟩ **CHAPTER 3 LONGITUDINAL STRENGTH** **Section 4 Buckling Strength** **402. Working stress** **1. Compression stresses** The compression stress σ_{act} (N/mm^2) acting on the members under consideration are given in the following formula, however, minimum value is not to be less than $30/K$: $$\sigma_{act} = \frac{(M_s + M_w)}{I} y \times 10^5 \quad (\text{N/mm}^2)$$ where: M_s = as specified in **Table 3.3.1.** For strength deck, value of M_s is taken 0 in case that M_s is always positive. M_w = wave bending moment as given in **Table 3.3.1.** For the members above the neutral axis of transverse section of hull, value of M_w is taken $M_w(-)$ and for the members under, value of M_w is taken $M_w(+)$. y = distance (m) from the neutral axis of transverse section of hull to the considered point. I = as specified in **301. 1**.	⟨Rules⟩ **CHAPTER 3 LONGITUDINAL STRENGTH** **Section 4 Buckling Strength** **402. Working stress** **1. Compression stresses** The compression stress σ_{act} (N/mm^2) acting on the members under consideration are given in the following formula, however, minimum value is not to be less than $30/K$: $$\sigma_{act} = \frac{(M_s + M_w)}{I} y \times 10^5 \quad (\text{N/mm}^2)$$ where: M_s = as specified in **Table 3.3.1.** ~~For strength deck, value of M_s is taken 0 in case that M_s is always positive.~~ M_w = wave bending moment as given in **Table 3.3.1.** For the members above the neutral axis of transverse section of hull, value of M_w is taken $M_w(-)$ and for the members under, value of M_w is taken $M_w(+)$. y = distance (m) from the neutral axis of transverse section of hull to the considered point. I = as specified in **301. 1**.	

Present	Amendment	Note
# CHAPTER 15 DEEP TANKS ## Section 2 Bulkheads of Deep Tanks **202. Bulkhead plates** 〈omit〉 **Table 3.15.2 Coefficient C_2**	# CHAPTER 15 DEEP TANKS ## Section 2 Bulkheads of Deep Tanks **202. Bulkhead plates** 〈same as current〉 **Table 3.15.2 Coefficient C_2**	

For h_1	longitudinal bulkhead of longitudinal framing	longitudinal bulkhead of transverse framing
	$C_2 = 13.4\sqrt{\frac{K}{27.7-\alpha K}}$	$C_2 = 100\sqrt{\frac{K}{767-\alpha^2 K^2}}$
	minimum : $3.6\sqrt{K}$	
For h_2 or h_3 and for transverse bulkhead	$C_2 = 3.6\sqrt{K}$	
〈omit〉		

〈omit〉

For h_1	longitudinal bulkhead of longitudinal framing	longitudinal bulkhead of transverse framing
	$C_2 = 13.4\sqrt{\frac{K}{27.7-\alpha K}}$	$C_2 = 100\sqrt{\frac{K}{767-\alpha^2 K^2}}$
	minimum : $3.2\sqrt{K}$	
For h_2 or h_3 and for transverse bulkhead	$C_2 = 3.6\sqrt{K}$	
〈same as current〉		

〈same as current〉

Section 3 Fittings of Deep Tanks

301. ~ 303. 〈omit〉

304. Cofferdam

1. The following dedicated tanks are to be separated from adjacent tanks by cofferdams. However, these cofferdams may be omitted provided that the common boundaries of lubricating oil and fuel oil tank have full penetration welds.
   (1) Fuel oil
   (2) Lubricating oil
   (3) Vegetable oil
   (4) Fresh water

Section 3 Fittings of Deep Tanks

301. ~ 303. 〈same as current〉

304. Cofferdam

1. A cofferdam means an empty space arranged so that compartments on each side have no common boundary; a cofferdam may be located vertically or horizontally. As a rule, a cofferdam is to be kept gas-tight and is to be properly ventilated, provided with drainage arrangement, and of sufficient size to allow proper inspection, maintenance and safe evacuation.

Present	Amendment	Note
	2. Cofferdams are to be provided between compartments intended for liquid hydrocarbons (including fuel oil, lubricating oil) and those intended for fresh water (water for propelling machinery and boilers) as well as tanks intended for the carriage of liquid foam for fire extinguishing.	
	3. Furthermore, tanks carrying fresh water for human consumption are to be separated from other tanks containing substances hazardous to human health by cofferdams or other means as approved by the Society. Normally, tanks for fresh water and water ballast are considered non-hazardous.	
	4. Where a corner to corner situation occurs, tanks are not considered to be adjacent.	
	5. The cofferdams specified in **Par. 1** may be waived when deemed impracticable or unreasonable by the Society in relation to the characteristics and dimensions of the spaces containing such tanks, provided that: (1) The thickness of common boundary plates of adjacent tanks is increased, with respect to the thickness obtained according to **Ch 15, Sec 2**, by 2 mm in the case of tanks carrying fresh water or boiler feed water, and by 1 mm in all other cases, (2) the sum of the throats of the weld fillets at the edges of these plates is not less than the thickness of the plates themselves, (3) the structural test is carried out with a test pressure increased by 1 m.	
2. The cofferdams in **Par. 1** are to be provided with the air pipes to comply with the requirements in **Pt 5, Ch 6, 201** and with the manholes of adequate size which are well accessible.	**6.** The cofferdams in **Par. 1** are to be provided with the air pipes to comply with the requirements in **Pt 5, Ch 6, 201** and with the manholes of adequate size which are well accessible.	
3. Crew spaces and passenger spaces are not to be directly adjacent to the tanks for carriage of fuel oil. Such compartments are to be separated from the fuel oil tanks by cofferdams which are well ventilated and are not less than 600 mm in width for easy access. Where the top of fuel oil tanks has no opening and is coated with incombustible coverings of 38 mm and over in thickness, the cofferdam between such compartments and the top of fuel oil tanks may be omitted.	**7.** Crew spaces and passenger spaces are not to be directly adjacent to the tanks for carriage of fuel oil. Such compartments are to be separated from the fuel oil tanks by cofferdams which are well ventilated and are not less than 600 mm in width for easy access. Where the top of fuel oil tanks has no opening and is coated with incombustible coverings of 38 mm and over in thickness, the cofferdam between such compartments and the top of fuel oil tanks may be omitted.	

Present	Amendment	Note
〈Guidance〉 CHAPTER 14 WATERTIGHT BULKHEAD Section 4 Watertight Door **404. Control** **1.** Where it is necessary to operate the power unit for remote operation of the watertight door required by **404.** of the Rules, means to operate the power unit are also to be provided at remote control stations. The operation of such remote control is to be in accordance with SOLAS II-1/13.8.1 to 13.8.3. For tankers, where there is a permanent access from a pipe tunnel to the main pump room, in accordance with SOLAS II-2/4.5.2.4 the watertight door shall be capable of being manually closed from outside the main pump room entrance in addition to the requirements above. **2.** 〈omit〉 **3.** 〈omit〉 **4.** Remote controls required by **404.** of the Rules, are to be in accordance with the followings. (1) The operating console at the navigation bridge is to have a "master switch" with following two modes of control. This switch is normally to be in the "local control" mode. The "remote control" mode is only used in an emergency or for testing purposes. Special consideration is to be given to the reliability of the "master switch". (a) A "local control" mode: This mode is to allow any door to be locally opened and locally closed after use without automatic closure. (b) A "remote control" mode: This mode is to permit doors to be able to be opened locally but is to be automatically reclose the doors upon release of the local control mechanism. (2) 〈omit〉 **5.~10.** 〈omit〉	〈Guidance〉 CHAPTER 14 WATERTIGHT BULKHEAD Section 4 Watertight Door **404. Control** **1.** Where it is necessary to operate the power unit for remote operation of the watertight door required by **404.** of the Rules, means to operate the power unit are also to be provided at remote control stations. For passenger ships, the operation of such remote control is to be in accordance with SOLAS II-1/13 For tankers, where there is a permanent access from a pipe tunnel to the main pump room, ~~in accordance with SOLAS II-2/4.5.2.4~~ the watertight door shall be capable of being manually closed from outside the main pump room entrance in addition to the requirements above. **2.** 〈same as current〉 **3.** 〈same as current〉 **4.** Remote controls required by **404.** of the Rules, are to be in accordance with the followings. (1) The operating console at the navigation bridge is to have a "master switch" with following two modes of control. This switch is normally to be in the "local control" mode. The "doors closed" mode is only used in an emergency or for testing purposes. Special consideration is to be given to the reliability of the "master switch". (a) A "local control" mode: This mode is to allow any door to be locally opened and locally closed after use without automatic closure. (b) A "doors closed" mode: This mode is to close automatically any door that is open on not more than 60 s with the ship in an upright position, it is to permit doors to be opened locally and is to re-close automatically the doors upon release of the local control mechanism. (2) 〈same as current〉 **5.~10.** 〈same as current〉	

Present	Amendment	Note
Annex 3-4 Guidance for the Hull Construction Monitoring Procedure **3. Phase 1 - Plan Development and Approval** (1) 〈omit〉 (2) 〈omit〉 (3) Hull construction monitoring plan (A) The hull construction monitoring plan (HCMP) is a document compiled by the shipyard to provide a record of the enhanced quality standards and procedures employed by the Shipbuilder to ensure that an increased level of construction quality control is employed at those areas of the structure that have been identified as critical to the vessel. (B) The HCMP is submitted to Head Office of this Society for formal approval as soon as possible prior to steel cutting. The HCMP is reviewed by both this society's site Surveyor and Plan Approval Surveyor in order that the findings of practical construction, structural analysis and fatigue analysis are uniquely reflected in the plan. Once approval is given, this society's site Surveyors maintain efficient contact between all interested parties to ensure that the requirements of the HCMP are fully understood and are complied with. (C) The HCMP is supplemental to and does not replace the Quality Plan provided by the Shipbuilder. (D)~(F) 〈omit〉	**Annex 3-4 Guidance for the Hull Construction Monitoring Procedure** **3. Phase 1 - Plan Development and Approval** (1) 〈same as current〉 (2) 〈same as current〉 (3) Hull construction monitoring plan (A) The hull construction monitoring plan (HCMP) is a document compiled by the shipyard to provide a record of the enhanced quality standards and procedures employed by the Shipbuilder to ensure that an increased level of construction quality control is employed at those areas of the structure that have been identified as critical to the vessel. (B) Prior to commencement of surveys for any newbuilding project, the HCMP is submitted to Head Office of this Society for formal approval. The HCMP is reviewed by both this society's site Surveyor and Plan Approval Surveyor in order that the findings of practical construction, structural analysis and fatigue analysis are uniquely reflected in the plan. Once approval is given, this society's site Surveyors maintain efficient contact between all interested parties to ensure that the requirements of the HCMP are fully understood and are complied with. (C) The HCMP is supplemental to and does not replace the Quality Plan provided by the Shipbuilder. (D)~(F) 〈same as current〉	

Main Amendments

(1) Background of Amendment

1) reflected IACS UR S10 Rev. 7
- S10.9.3.1 : reflects material properties used for rudder trunk to fillet shoulder radius, and clarifies that requirement is only applicable to trunks which are extending below the shell or the skeg

(1) Effective date : ships contracted for construction on or after 1 July 2024

Present	Amendment	Note
# CHAPTER 2 STEMS AND STERN FRAMES ## Section 1 Stems 〈omitted〉 ## Section 2 Stern Frames **202. ~ 207. <omitted>** **210. Rudder trunk** The requirements in this section apply to trunk configurations which are extended below stern frame and arranged in such a way that the trunk is stressed by forces due to rudder action. *(2021)* **1. Materials, welding and connection to hull** (1) ~ (2) 〈omitted〉 (3) The weld at the connection between the rudder trunk and the shell or the bottom of the skeg is to be full penetration. The fillet shoulder radius r, in mm (see **Fig 3.2.7**) is to be as large as practicable and to comply with the following formulae: *(2021)* $r = 0.1 d_l$ without being less than: $r = 60$ (mm) when $\sigma \geq \frac{40}{K}$ (N/mm^2) $r = 30$ (mm) when $\sigma < \frac{40}{K}$ (N/mm^2) Where: d_l = rudder stock diameter axis defined in **Pt 4, Ch 1, 502.** of the Rules σ = bending stress in the rudder trunk in (N/mm^2) K = material factor as given in **207. 3**	# CHAPTER 2 STEMS AND STERN FRAMES ## Section 1 Stems 〈same as present〉 ## Section 2 Stern Frames **202. ~ 207. <same as present>** **210. Rudder trunk** The requirements in this section apply to trunk configurations which are extended below stern frame and arranged in such a way that the trunk is stressed by forces due to rudder action. **1. Materials, welding and connection to hull** (1) ~ (2) 〈same as present〉 (3) The weld at the connection between the rudder trunk and the shell or the bottom of the skeg is to be full penetration. For rudder trunks extending below shell or skeg, the fillet shoulder radius r, in mm (see **Fig 3.2.7**) is to be as large as practicable and to comply with the following formulae: $r = 0.1 d_l / K$ without being less than: $r = 60$ (mm) when $\sigma \geq \frac{40}{K}$ (N/mm^2) $r = 30$ (mm) when $\sigma < \frac{40}{K}$ (N/mm^2) Where: d_l = rudder stock diameter axis defined in **Pt 4, Ch 1, 502.** of the Rules σ = bending stress in the rudder trunk in (N/mm^2) K = material factor for the rudder trunk as given in **207. 3**	IACS UR S10 Rev. 7 9.3.1 (Clarify the requirement regarding the fillet shoulder radius)