

Present	Amendment	Note
<p style="text-align: center;">Part 7 <Rule></p> <p>CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK</p> <p style="text-align: center;">Section 1 ~ Section 3 <omit></p> <p style="text-align: center;">Section 4 Cargo Containment</p> <p>403. ~ 405. <omit></p> <p>406. Design of secondary barriers [See Rules]</p> <p>1. Standards of secondary barrier <omit></p> <p>2. Periodical Inspection of Secondary Barrier</p> <p>(1) With respect to the requirement of 406. 2 (4), it is to be verified that secondary barriers keep a specific level of tightness required in the system design in accordance with an appropriated procedures.</p> <p>(2) For cargo containment system with glued secondary barriers, at the time of construction, tightness test are to be carried out in accordance with approved system designers' procedure and acceptance criteria before and after initial cool down and related values obtained in the test are to be recorded for the use as reference for periodical surveys.</p> <p>(A) Low differential pressures tests are not considered an acceptable test.</p> <p>(B) If the designer's threshold values are exceeded, an investigation is to be carried out and additional testing such as differential pressure, thermographic or acoustic emissions testing is to be carried out as necessary.</p> <p>(3), (4) <omit></p> <p>3. Thermal stress analysis for hull structure <omit></p> <p>407. ~ 428. <omit></p> <p style="text-align: center;">Section 5 ~ Section 19 <omit></p> <p style="text-align: right;">↓</p>	<p style="text-align: center;">Part 7 <Rule></p> <p>CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK</p> <p style="text-align: center;">Section 1 ~ Section 3 <same as current></p> <p style="text-align: center;">Section 4 Cargo Containment</p> <p>403. ~ 405. <same as current></p> <p>406. Design of secondary barriers [See Rules]</p> <p>1. Standards of secondary barrier <same as current></p> <p>2. Periodical Inspection of Secondary Barrier</p> <p>(1) With respect to the requirement of 406. 2 (4), it is to be verified that secondary barriers keep a specific level of tightness required in the system design in accordance with an appropriated procedures.</p> <p>(2) For cargo containment system with glued secondary barriers, at the time of construction, tightness test are to be carried out in accordance with approved system designers' procedure and acceptance criteria before and after initial cool down. <u>The values recorded are to be used as reference for future assessment of secondary barrier tightness.</u></p> <p>(A) Low differential pressures tests are not considered an acceptable test.</p> <p>(B) If the designer's threshold values are exceeded, an investigation is to be carried out and additional testing such as differential pressure, thermographic or acoustic emissions testing is to be carried out as necessary.</p> <p>(3), (4) <same as current></p> <p>3. Thermal stress analysis for hull structure <same as current></p> <p>407. ~ 428. <same as current></p> <p style="text-align: center;">Section 5 ~ Section 19 <same as current></p> <p style="text-align: right;">↓</p>	<p style="text-align: center;">- UI GC 12 Interpretation</p>

Amendments of the Rule Guidance

(Internal review)

Pt. 7 Ships for Special Service

Ch. 6 Ships Carrying Dangerous Chemicals in Bulk



2020. 02.

Hull Rule Development Team

Present	Amendment	Note
<p style="text-align: center;">Pt. 7 Ships of Special Service <Guidance></p> <p style="text-align: center;">Ch. 6 SHIPS CARRYING DANGEROUS CHEMICALS IN BULK</p> <p style="text-align: center;">Section 1, Section 2 <omit> Section 3 Ship Arrangements</p> <p>301. Cargo segregation <omit></p> <p>302. Accommodation, service and machinery spaces and control stations [See Rule]</p> <p>1. , 2 <omit></p> <p>3. Entrances, air inlets and openings to accommodation, service and machinery spaces and control stations</p> <p>(1) <omit></p> <p>(2) Spaces where doors can be provided are to be restricted to lockers containing cargo gears and safety equipment, cargo control room and decontamination shower room. As given in Fig 7.6.15 of the Guidance, these spaces are not provided with passageways led to accommodation spaces and service spaces and control station, and the casings, floors and ceilings adjacent to the accommodation spaces are to be insulated to "A-60" standard.</p>	<p style="text-align: center;">Pt. 7 Ships of Special Service <Guidance></p> <p style="text-align: center;">Ch. 6 SHIPS CARRYING DANGEROUS CHEMICALS IN BULK</p> <p style="text-align: center;">Section 1, Section 2 <same as current> Section 3 Ship Arrangements</p> <p>301. Cargo segregation <same as current></p> <p>302. Accommodation, service and machinery spaces and control stations [See Rule]</p> <p>1. , 2 <same as current></p> <p>3. Entrances, air inlets and openings to accommodation, service and machinery spaces and control stations</p> <p>(1) <same as current></p> <p>(2) Spaces where doors can be provided are to be restricted to lockers containing cargo gears and safety equipment, cargo control room and decontamination shower room. As given in Fig 7.6.15 of the Guidance, these spaces are not provided with passageways led to accommodation spaces and service spaces and control station, and the casings, floors and ceilings adjacent to the accommodation spaces are to be insulated to "A-60" standard. <u>However for ships carrying cargoes having a flash point above 60°C, the requirements for boundaries with cargo areas may apply to the provisions of Ch.11 1101. 3 (or Pt.8 Ch. 7 103.) of the Rule.</u></p>	

Present	Amendment	Note
<div data-bbox="253 236 819 606" style="border: 1px solid black; height: 232px; width: 253px; margin-bottom: 20px;"></div> <p data-bbox="159 762 376 794">(3) , (4) <omit></p> <p data-bbox="91 821 392 853">303. ~ 307. <omit></p> <p data-bbox="120 906 584 938">Section 5 ~ Section 21 <omit></p> <div data-bbox="913 959 943 986" style="text-align: center;">↓</div>	<div data-bbox="1164 236 1731 606" style="border: 1px solid black; height: 232px; width: 253px; margin-bottom: 20px;"></div> <p data-bbox="1066 627 1890 715"><Note> <u>Insulation for ships carrying cargoes having a flash point above 60°C.</u></p> <p data-bbox="1066 810 1413 842">(3) , (4) <same as current></p> <p data-bbox="1003 869 1464 901">303. ~ 307. <same as current></p> <p data-bbox="1032 954 1659 986">Section 5 ~ Section 21 <same as current></p> <div data-bbox="1823 1007 1852 1034" style="text-align: center;">↓</div>	

GUIDANCE RELATING TO THE RULES FOR THE CLASSIFICATION OF STEEL SHIPS

(Guidance Part 7 Ships of Special Service[Ch 5,6])

- External Inquiry -

2019.12.



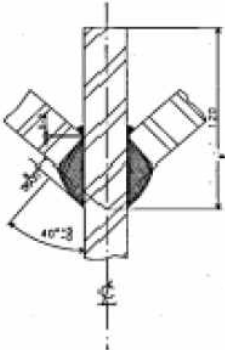
Hull Rule Development Team

- Main Amendments -

● To reflect Request for Establishment/Revision of Classification Technical Rules

- Reflection of GC20(Tee welds in type A or type B independent tanks) and GC21(Welds of type C independent bi-lobe tank with centreline bulkhead)

Present	Amendment	reason
<p style="text-align: center;">CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK</p> <p style="text-align: center;">Section 1 ~ Section 3 <Omitted></p> <p style="text-align: center;">Section 4 Cargo Containment</p> <p>401. ~ 419. <Omitted></p> <p>420. Construction processes [See Rule]</p> <p>1. Independent tanks</p> <p>(1) ~ (2) <Omitted></p> <p>(3) <New></p> <p>(3) In welding of the penetrations referred to in the proceeding (2) full penetration type welding may not be required, but are to have proper grooves. <Omitted></p>	<p style="text-align: center;">CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK</p> <p style="text-align: center;">Section 1 ~ Section 3 <Same as the present Guidances></p> <p style="text-align: center;">Section 4 Cargo Containment</p> <p>401. ~ 419. <Same as the present Guidances></p> <p>420. Construction processes [See Rule]</p> <p>1. Independent tanks</p> <p>(1) ~ (2) <Same as the present Guidances></p> <p>(3) <u>The requirements in 420. 1 (1) of the Rules is applicable to independent tanks of type A or type B, primarily constructed of plane surfaces. This includes the tank corners which are constructed using bent plating which is aligned with the tank surfaces and connected with in-plane welding.</u></p> <p>(A) <u>The applicability of the expression “For dome-to-shell connections only” is clarified as follows:</u></p> <p>(a) <u>Welded corners(i.e. corners made of weld metal) shall not be used in the main tank shell construction, I.e. corners between shell side(sloped plane surfaces parallel to hopper or top side inclusive if any) and bottom or top of the tank, and between tank end transverse bulkheads and bottom, top or shell sides(sloped plane surfaces inclusive if any) of the tank. Instead, tank corners which are constructed using bent plating aligned with the tank surfaces and connected with in-plane welds are to be used.</u></p> <p>(b) <u>Tee welds can be accepted for other localised constructions of the shell such as suction well, sump, dome, etc. where tee welds of full penetration type shall also be used.</u></p> <p>(4) In welding of the penetrations referred to in the proceeding (2) full penetration type welding may not be required, but are to have proper grooves. <Same as the present Guidances></p>	<p>Reflection of GC20(Tee welds in type A or type B independent tanks)</p>

Present	Amendment	reason
<p>(5) <New></p> <p>(4) The “specifically approved by the Society” referred to in the requirements in 420. 1 (2) (A) of the Rules means the case of tanks where MARVS is 1.0MPa or below and the design temperature is higher than -10°C satisfying both of the following requirements (A) and (B). <Omitted></p> <p>422. ~ 428. <Omitted></p> <p style="text-align: center;">Section 5 <Omitted></p>	<p>(5) <u>The requirements in 420. 1 (2) of the Rules is applicable to type C independent tanks including bi-lobe tanks, primarily constructed of curved surfaces fitted a centreline bulkhead. The applicability of the expression “Other edge preparations” is clarified as follows.</u></p> <p>(A) <u>Cruciform full penetration welded joints in a bi-lobe tank with centreline bulkhead can be accepted for the tank structure at tank centreline welds with bevel preparation subject to the approval of the Society, based on the results of the tests carried out at the approval of the welding procedure.(See below example)</u></p> <div style="text-align: center;">  </div> <p>(6) The “specifically approved by the Society” referred to in the requirements in 420. 1 (2) (A) of the Rules means the case of tanks where MARVS is 1.0MPa or below and the design temperature is higher than -10°C satisfying both of the following requirements (A) and (B). <Same as the present Guidances></p> <p>422. ~ 428. <Same as the present Guidances></p> <p style="text-align: center;">Section 5 <Same as the present guidance></p>	<p>Reflection of GC21(Welds of type C independent bi-lobe tank with centreline bulkhead)</p>

Present	Amendment	reason
<p style="text-align: center;">CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK</p> <p style="text-align: center;">Section 6 Materials of Construction and Quality Control</p> <p>603. ~ 604. <Omitted></p> <p>605. Welding of metallic materials and non-destructive testing</p> <p>1. <Omitted></p> <p>2. Welding procedure qualification tests of cargo tanks and process pressure vessels [See Rule]</p> <p>(1) ~ (3) <Omitted></p> <p>(4) For the purpose of the requirements in 605. 3 (5) (A) of the Rules, the transverse tensile strength of weld metal which has lower tensile strength than that of the parent metal, e.g. in the case of 9% nickel steel, is to comply with the requirements in Pt 2, Ch 2, 404. 5 of the Rules.</p> <p>(5) For the purpose of the requirements in 605. 3 (5) (B) of the Rules, bend tests are also to comply with the requirements in Pt 2, Ch 2, 404. 6 of the Rules. In case where the base metal is of RLP9 specified in Pt 2, Ch 1 of the Rules, bend tests may be omitted.</p> <p>(6) For the purpose of the requirements in 605. 3 (5) of the Rules, the test temperature of impact tests may be determined in accordance with the requirements in 603. 2 of the Guidance.</p> <p>(7) In application to 605. 3 (3) of the Rules, radiographic or ultrasonic testing may be performed at the option of the Society. (2017)</p> <p>(8) In application to 605. 3 (5) of the Rules, besides aluminium alloys, it may also be accepted subject to agreement with the Society that the transverse weld tensile strength is not to be less than the specified minimum tensile strength for the deposited metal, where the weld metal has lower tensile strength than that of the parent metal. (2017)</p> <p>606. <Omitted></p> <p style="text-align: center;">Section 7 ~ Section 19 < Omitted></p>	<p style="text-align: center;">CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK</p> <p style="text-align: center;">Section 6 Materials of Construction and Quality Control</p> <p>603. ~ 604. <Same as the present Guidances></p> <p>605. Welding of metallic materials and non-destructive testing</p> <p>1. <Same as the present Guidances></p> <p>2. Welding procedure qualification tests of cargo tanks and process pressure vessels [See Rule]</p> <p>(1) ~ (3) <Same as the present Guidance></p> <p>(4) For the purpose of the requirements in 605. 3 (5) (B) of the Rules, bend tests are also to comply with the requirements in Pt 2, Ch 2, 404. 5 of the Rules. In case where the base metal is of RLP9 specified in Pt 2, Ch 1 of the Rules, bend tests may be omitted.</p> <p>(5) For the purpose of the requirements in 605. 3 (5) of the Rules, the test temperature of impact tests may be determined in accordance with the requirements in 603. 2 of the Guidance.</p> <p>(6) In application to 605. 3 (3) of the Rules, radiographic or ultrasonic testing may be performed at the option of the Society. (2017)</p> <p>(7) In application to 605. 3 (5) of the Rules, besides aluminium alloys, it may also be accepted subject to agreement with the Society that the transverse weld tensile strength is not to be less than the specified minimum tensile strength for the deposited metal, where the weld metal has lower tensile strength than that of the parent metal. (2017)</p> <p>606. <Same as the present Guidances></p> <p style="text-align: center;">Section 7 ~ Section 19 < Same as the present Guidances></p>	<p>Reflection of request for establishment/revision of classification technical rules</p>

GUIDANCE RELATING TO THE RULES FOR THE CLASSIFICATION OF STEEL SHIPS

(Guidance Part 7 Ships of Special Service[Ch 5,6])



Hull Rule Development Team

- Main Amendments -

(1) Enter into force on 1 January 2020 (the contract date for ship construction)

● To reflect Request for Establishment/Revision of Classification Technical Rules

Present	Amendment
<p style="text-align: center;">CHAPTER 1 SHIPS CARRYING LIQUEFIED GASES IN BULK</p> <p style="text-align: center;">Section 1 ~ Section 3 <Omitted></p> <p style="text-align: center;">Section 4 Cargo Containment</p> <p>401. ~ 418. <Omitted></p> <p>419. Materials [See Rule]</p> <p>1. ~ 8. <Omitted></p> <p><u>9. <New></u></p> <p style="text-align: center;">Section 5 ~ Section 19 <Omitted></p>	<p style="text-align: center;">CHAPTER 1 SHIPS CARRYING LIQUEFIED GASES IN BULK</p> <p style="text-align: center;">Section 1 ~ Section 3 <Sames as the present guidance></p> <p style="text-align: center;">Section 4 Cargo Containment</p> <p>401. ~ 418. <Sames as the present guidance></p> <p>419. Materials [See Rule]</p> <p>1. ~ 8. <Sames as the present guidance></p> <p><u>9. Materials of primary and secondary barriers</u></p> <p><u>(1) The high manganese austenitic steel for cargo tank for the carriage of liquefied natural gases is to comply with Annex 7A-4. (2020)</u></p> <p style="text-align: center;">Section 5 ~ Section 19 <Sames as the present guidance></p>

Present	Amendment
<p data-bbox="439 181 887 236">Annex 7A-1 ~ Annex 7A-3 <Omitted></p> <p data-bbox="421 274 913 363"><u>Annex 7A-4 High manganese austenitic steel for Cryogenic Service <New></u></p>	<p data-bbox="1191 181 1809 210">Annex 7A-1 ~ Annex 7A-3 <Omitted></p> <p data-bbox="1102 242 1908 306"><u>Annex 7A-4 High manganese austenitic steel for Cryogenic Service</u></p> <p data-bbox="1317 347 1621 376"><u>Section 1 General</u></p> <p data-bbox="967 418 1124 446"><u>101. Scope</u></p> <p data-bbox="994 469 1977 587">1. This Annex provides the designer and manufacturer with practical information on the design and construction of cargo tanks using high manganese austenitic steel for cryogenic service to comply with the Design Conditions defined in Pt7, Chapter 5, 418.</p> <p data-bbox="967 641 1191 670"><u>102. Application</u></p> <p data-bbox="994 692 1977 810">1. This Annex are not intended to replace any requirements of Pt7, Chapter 5. They are intended as complementary guidelines on how to utilize high manganese austenitic steel in the design and fabrication of cargo tanks complying with the Pt7, Chapter 5.</p> <p data-bbox="967 865 1182 893"><u>103. Definitions</u></p> <p data-bbox="994 916 1977 976">1. Under-matched welds means for welded connections where the weld metal has lower yield- or tensile-strength than the parent metal.</p> <p data-bbox="1290 1034 1648 1062"><u>Section 2 Application</u></p> <p data-bbox="967 1098 1294 1126"><u>201. Design application</u></p> <p data-bbox="994 1149 1977 1238">1. The relevant load conditions and design conditions should be established in accordance with Pt7, Chapter 5, 418. A guidance on special considerations to the high manganese austenitic steel is described beolw.</p> <p data-bbox="994 1257 1977 1375">2. For the selection of relevant safety factors for high manganese austenitic steels(see Pt7, Chapter 5, 421 to 423), the safety factors specified for “Austenitic Steels“ should be applied both for base material and for as welded condition</p>

Present	Amendment															
	<p>202. Ultimate design condition</p> <p>1. It should be noted that high manganese austenitic steels normally have under-matched welds and, therefore, it is of great importance that the design values of the yield strength and tensile strength are based on the “minimum mechanical properties“ for the base material and as welded condition(see 6 Mechanical Properties). Note the limitation to under-matched welds defined in Pt7, Chapter 5, 418.1.(3).(B).</p> <p>203. Buckling strength</p> <p>1. Buckling strength analysis should be carried out based on recognized standards. Functional loads as defined in Pt7, Chapter 5, 403.4 should be considered. Note that design tolerances should be considered where relevant and be included in the strength assessment as required in Pt7, Chapter 5, 606.2.(1).</p> <p>204. Fatigue design condition</p> <p>1. The fatigue design curves for base material and for butt weld joint should use S-N curve of D grade in IIW.</p> <p>2. The fatigue design curves for other weld joints except butt weld joint should be agreed with the Society.</p> <p>3. Design S-N curve given in Table 1 correspond to a probability of survival of 97.6%.</p> <p style="text-align: center;">Table 1 S-N curves in air</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">S-N curve</th> <th colspan="2">$N \leq 10^7$ cycles</th> <th>$N > 10^7$ cycles</th> <th rowspan="2">Fatigue limit at 10⁷ cycle(MPa)</th> <th rowspan="2">Thickness exponent k</th> </tr> <tr> <th>m_1</th> <th>$\log a_1$</th> <th>$\frac{\log a_2}{m_2 = 5.0}$</th> </tr> </thead> <tbody> <tr> <td>D</td> <td>3.0</td> <td>12.164</td> <td>15.606</td> <td>52.63</td> <td>0.20</td> </tr> </tbody> </table>	S-N curve	$N \leq 10^7$ cycles		$N > 10^7$ cycles	Fatigue limit at 10 ⁷ cycle(MPa)	Thickness exponent k	m_1	$\log a_1$	$\frac{\log a_2}{m_2 = 5.0}$	D	3.0	12.164	15.606	52.63	0.20
S-N curve	$N \leq 10^7$ cycles		$N > 10^7$ cycles	Fatigue limit at 10 ⁷ cycle(MPa)	Thickness exponent k											
	m_1	$\log a_1$	$\frac{\log a_2}{m_2 = 5.0}$													
D	3.0	12.164	15.606	52.63	0.20											

Present	Amendment
	<p>205. Fracture mechanics analyses</p> <ol style="list-style-type: none"> <li data-bbox="994 264 1977 323">1. For a cargo tank where a reduced secondary barrier is applied, fracture mechanics analysis should be carried out in accordance with Pt7, Chapter 5. <li data-bbox="994 344 1977 647">2. Fracture toughness properties should be expressed using recognized standards. Depending on the material, fracture toughness properties determined for loading rates similar to those expected in the tank system should be required. The fatigue crack propagation rate properties should be documented for the tank material and its welded joints for the relevant service conditions. These properties should be expressed using a recognized fracture mechanics practice relating the fatigue crack propagation rate to the variation in stress intensity, ΔK, at the crack tip. The effect of stresses produced by static loads should be taken into account when establishing the choice of fatigue crack propagation rate parameters. <li data-bbox="994 668 1977 754">3. Note that for the application where very high static load utilization is relevant, alternative methods such as ductile fracture mechanics analysis should be considered. <li data-bbox="994 775 1977 956">4. A fracture mechanics analysis is required for type B tank(Pt7, Chapter 5, 422.4) where a reduced secondary barrier is applied. Fracture mechanics analysis may also be required for other tank types as found relevant to show compliance with fatigue and crack propagation properties. Note that CTOD values used in fracture mechanics analysis may in any case be an important property to analyze to ensure that materials are considered suitable for the application.

Present	Amendment
	<p>206. Welding</p> <ol style="list-style-type: none"> 1. <u>Welding should be carried out in accordance with Pt7, Chapter 5, 605.</u> 2. <u>For welding the following points can be considered:</u> <ol style="list-style-type: none"> (1) <u>For reducing the heat input during production:</u> <ol style="list-style-type: none"> (A) <u>special attention should be given to the first root pass when applying flux-cored arc welding(FCAW); reduced amperage should be considered;</u> (B) <u>welding heat input is to be equal to 30 kJ/cm or below;</u> (2) <u>Distance between the weld and nozzle should be kept to a minimum to reduce the oxygen content at the vicinity of the weld pool;</u> (3) <u>Weld gas composition of FCAW should normally be an 80/20 mix of argon and carbon dioxide; and</u> (4) <u>Appropriate ventilation should be provided to reduce exposure to hazardous welding fumes.</u> <p>207. Non-destructive testing(NDT)</p> <ol style="list-style-type: none"> 1. <u>The scope of non-destructive testing(NDT) should be as required by Pt7, Chapter 5, 605.6. NDT procedures should be in accordance with recognized standards to the satisfaction of the Society. For high manganese austenitic steel suitable NDT procedure normally applicable for austenitic steels should be used.</u> <p>208. Corrosion resistance</p> <ol style="list-style-type: none"> 1. <u>High manganese austenitic steel is not considered a very strong corrosion resistant material in line with several similar materials such as 304 stainless steel. Particularly for LNG cargo tanks that may not be in operation, appropriate environment should be maintained to prevent corrosion.</u>

GUIDANCE RELATING TO RULES FOR CLASSIFICATION OF STEEL SHIPS

(Development Review : External Opinion Inquiry)

Part 7 Chapter 5 Ships Carrying Liquefied Gases in Bulk

2019. 11.



Machinery Rule Development Team

– Main Amendments –

(1) Reflecting IACS Res. <2020.01.01.>

- IACS UI GC 25 (Rev.1, April 2019)

- exception of Cargo piping insulation to protect personnel

- IACS UI GC 28 (New, Dec. 2018)

- Guidance for sizing pressure relief systems for interbarrier spaces

Present	Amendment	Reason
<p align="center">Section 5 Process Pressure Vessels and liquid, Vapour and Pressure Piping Systems</p> <p>501. to 511. <omitted></p> <p>512. Materials [See Rule]</p> <p>1. to 3. <omitted></p> <p>4. With reference to 3. (1) of the Rules, the phrase ‘a thermal insulation system as required to minimize heat leak into the cargo during transfer operations’ means <u>that the properties of the thermal insulation for cargo piping systems are to take into consideration the overall heat calculation undertaken for the tank containment system and the capacity of the proposed pressure/temperature control system (e.g. refrigeration plants) adopted on each ship in accordance with the requirements of Ch.7 of the Rule.</u></p> <p>The phrase ‘cargo piping systems are to be provided with a thermal insulation system as required ... to protect personnel from direct contact with cold surfaces’ means that surfaces of cargo piping systems with which personnel is likely to contact under normal conditions are to be protected by a thermal insulation. <u>with the exception for the following ones;</u></p> <p>(1) surfaces of cargo piping systems which are protected by physical screening measures to prevent such direct contact;</p> <p>(2) surfaces of manual valves, having extended spindles that protect the operator from the cargo temperature,</p> <p>(3) surfaces of cargo piping systems whose design temperature (to be determined from inner fluid temperature) is above minus 10 °C.</p>	<p align="center">Section 5 Process Pressure Vessels and liquid, Vapour and Pressure Piping Systems</p> <p>501. to 511. <same as the present Rules></p> <p>512. Materials [See Rule]</p> <p>1. to 3. <same as the present Rules></p> <p>4. With reference to 3. (1) of the Rules, the phrase ‘a thermal insulation system as required to minimize heat leak into the cargo during transfer operations’ means <u>that properties of the piping insulation are to be taken into consideration when calculating the heat balance of the containment system and capacity of the pressure/temperature control system.</u></p> <p>The phrase ‘cargo piping systems shall be provided with a thermal insulation system as required ... to protect personnel from direct contact with cold surfaces’ means that surfaces of cargo piping systems with which personnel is likely to contact under normal conditions shall be protected by a thermal insulation, <u>with the exception for the below examples:</u></p> <p>(1) surfaces of cargo piping systems which are protected by physical screening measures to prevent such direct contact;</p> <p>(2) surfaces of manual valves, having extended spindles that protect the operator from the cargo temperature,</p> <p>(3) surfaces of cargo piping systems whose design temperature (to be determined from inner fluid temperature) is above minus 10 °C.</p>	<p align="center"><IACS UI GC25 Rev.1></p>

Present	Amendment	Reason
<p>Section 8 Vent System for Cargo Containment</p> <p>801. General [See Rule]</p> <p>For the purpose of the requirements in 801. of the Rules, the pressure relief system of hold spaces is to be in accordance with the following requirements :</p> <p>(1) to (3) <omitted></p> <p>802. Pressure relief systems</p> <p>1. Pressure relief system for interbarrier spaces</p> <p>(1) to (3) <omitted></p> <p>(4) The relieving capacity of pressure relief devices for interbarrier spaces is to be determined as followings :</p> <p>(A) to (D) <omitted></p> <p>(E) <u>Interbarrier space pressure relief devices in the scope of this paragraph are emergency devices for protecting the hull structure from being unduly overstressed in case of a pressure rise in the interbarrier space due to primary barrier failure. Therefore, such devices need not comply with the requirements in 802. 10 and 802. 11 of the Rules.</u></p>	<p>Section 8 Vent System for Cargo Containment</p> <p>801. General [See Rule]</p> <p>1. For the purpose of the requirements in 801. of the Rules, the pressure relief system of hold spaces is to be in accordance with the following requirements :</p> <p>(1) to (3) <same as the present Rules></p> <p>2. <u>For the purpose of the requirements in 801. of the Rules, the pressure relief system of interbarrier spaces is to be in accordance with 802. 1.</u></p> <p>802. Pressure relief systems</p> <p>1. Pressure relief system for interbarrier spaces</p> <p>(1) to (3) <same as the present Rules></p> <p>(4) The relieving capacity of pressure relief devices for interbarrier spaces is to be determined as followings :</p> <p>(A) to (D) <omitted></p> <p>(E) Interbarrier space pressure relief devices in the scope of this paragraph are emergency devices for protecting the hull structure from being unduly overstressed in case of a pressure rise in the interbarrier space due to primary barrier failure. Therefore, such devices need not comply with the requirements in 802. 10 and 802. 11 of the Rules.</p>	<p><IACS UI GC28 New></p> <p><Result of 6th CCC meeting></p>

GUIDANCE RELATING TO RULES FOR CLASSIFICATION OF STEEL SHIPS

(Development Review : External Opinion Inquiry)

Part 7 Chapter 5 Ships Carrying Liquefied Gases in Bulk

2020. 01.



Machinery Rule Development Team

– Main Amendments –

- (1) Requirements for inert gas system <2020.07.01.>
 - revised to be applicable to inert gas system for liquefied gas carrier
- (2) Reflected MSC Circ.1617 <2020.07.01.>
 - revised to be applicable to inert gas system for liquefied gas carrier

Present	Amendment	Reason
<p align="center">Section 9 Cargo Containment System Atmosphere Control</p> <p>901. to 903. <omitted></p> <p>904. Inerting [See Rule]</p> <p>1. to 2. <omitted></p> <p>3. Prevention of the back flow of cargo vapour</p> <p>For the purpose of the requirements in 904. 3 of the Rules, the arrangement to prevent the back flow of cargo vapour from entering the inert gas system is to be in accordance with 301. 4 (1) of the Guidance. (See Fig 7.5.36 of the Guidance)</p> <p>4. <omitted></p> <p>905. Inert gas production on board</p> <p>1. Inert gas production equipment [See Rule]</p> <p>(1) For the purpose of the requirements in 905. 1 of the Rules, the combustion type inerting systems are to be in accordance with the relevant requirements of Pt 8, Annex 8-5, 5 of the Guidance and the following requirements (A) to (C). (A) to (C) <omitted></p> <p>(2) to (3) <omitted></p>	<p align="center">Section 9 Cargo Containment System Atmosphere Control</p> <p>901. to 903. <same as the present></p> <p>904. Inerting [See Rule]</p> <p>1. to 2. <same as the present></p> <p>3. Prevention of the back flow of cargo vapour</p> <p>For the purpose of the requirements in 904. 4 of the Rules, the arrangement to prevent the back flow of cargo vapour from entering the inert gas system is to be in accordance with 502. 1 (1) of the Guidance. (See Fig 7.5.36 of the Guidance)</p> <p>4. <same as the present></p> <p>905. Inert gas production on board</p> <p>1. Inert gas production equipment [See Rule]</p> <p>(1) For the purpose of the requirements in 905. 1 of the Rules, the combustion type inerting systems are to be in accordance with the relevant requirements of Pt 8, Annex 8-5, 5 (1) to (5) of the Guidance and the following requirements (A) to (C). (A) to (C) <same as the present></p> <p>(2) to (3) <same as the present></p>	<p>- correction of errors</p> <p>- reflected UR F20 20.4</p>

Present	Amendment	Reason
<p>Section 11 Fire Protection and Fire Extinction</p> <p>1101. to 1102. <omitted></p> <p>1103. Water spray system</p> <p>1. to 5. <omitted> <newly added></p> <p>1104. Dry chemical powder fire-extinguishing systems [See Rule]</p> <p>1. to 3. <omitted> <newly added></p>	<p>Section 11 Fire Protection and Fire Extinction</p> <p>1101. to 1102. <same as the present></p> <p>1103. Water spray system</p> <p>1. to 5. <same as the present></p> <p><u>6. Extension of cargo area</u></p> <p><u>Where "F.O. tanks" are installed at the after end of the aftermost hold space or at the forward end of the forwardmost hold space instead of cofferdams as allowed for in paragraphs 301. 2 and 2 of the Rules, the weather deck area above these tanks is to be regarded as a "cargo area" for the purpose of applying 1103. 6 of the Rules.</u></p> <p>1104. Dry chemical powder fire-extinguishing systems [See Rule]</p> <p>1. to 3. <same as the present></p> <p><u>4. Testing of systems</u></p> <p><u>For the purpose of the requirements in 1104. 8 of the Rules, testing arrangements are to involve the discharge using dry chemical powder from all monitors and hand hose lines on board but it is not required that there is a full discharge of the installed quantity of dry powder. This testing can also be used to satisfy the requirement that the piping is free of obstructions, in lieu of blowing through with dry air all the distribution piping. However, after the completion of this testing, the system, including all monitors and hand hose lines, is to be blown through with dry air but only for the purpose of the system subsequently being clear from any residues of dry chemical powder.</u></p>	<p>- reflected MSC Circ.1617</p> <p>- reflected MSC Circ.1617</p>

GUIDANCE RELATING TO RULES FOR CLASSIFICATION OF STEEL SHIPS

(Development Review : External Opinion Inquiry)

Part 1 Classification and Survey

2020. 01.



– Main Amendments –

(1) Additional Installations Notations “IGS” <2020.07.01.>

- Relevant Requirements of Additional Installations Notations “IGS” of liquefied gas carrier has been revised.

Present	Amendment	Reason												
<p align="center">Annex 1-1 Character of Classification</p> <p>1. Class Notation</p> <p>1.1 Ship Type and Special Feature Notations</p> <p><omitted></p> <p>1.2 Additional Installations Notations</p> <p>The following Additional Installations Notations may be appended to ships complying with the relevant requirements.</p> <table border="1" data-bbox="226 564 947 783"> <thead> <tr> <th colspan="2">Additional Installations Notations</th> <th>Relevant Requirements</th> </tr> </thead> <tbody> <tr> <td>Machinery Items</td> <td>IGS</td> <td>to ships where the Inert Gas Systems specified in Pt 8, Ch 2, 405. of the Rules are provided onboard.</td> </tr> </tbody> </table> <p><hereafter, omitted></p>	Additional Installations Notations		Relevant Requirements	Machinery Items	IGS	to ships where the Inert Gas Systems specified in Pt 8, Ch 2, 405. of the Rules are provided onboard.	<p align="center">Annex 1-1 Character of Classification</p> <p>1. Class Notation</p> <p>1.1 Ship Type and Special Feature Notations</p> <p><same as the present></p> <p>1.2 Additional Installations Notations</p> <p>The following Additional Installations Notations may be appended to ships complying with the relevant requirements.</p> <table border="1" data-bbox="1050 564 1771 938"> <thead> <tr> <th colspan="2">Additional Installations Notations</th> <th>Relevant Requirements</th> </tr> </thead> <tbody> <tr> <td>Machinery Items</td> <td>IGS</td> <td>to ships where the Inert Gas Systems specified in Pt 8, Ch 2, 405. of the Rules are provided onboard, <u>other than ships carrying liquefied gases in bulk.</u> to ships carrying liquefied gases in bulk where the Inert Gas Systems specified in Pt 7, Ch 5, 905. 1 of the Rules are provided onboard.</td> </tr> </tbody> </table> <p><hereafter, same as the present></p>	Additional Installations Notations		Relevant Requirements	Machinery Items	IGS	to ships where the Inert Gas Systems specified in Pt 8, Ch 2, 405. of the Rules are provided onboard, <u>other than ships carrying liquefied gases in bulk.</u> to ships carrying liquefied gases in bulk where the Inert Gas Systems specified in Pt 7, Ch 5, 905. 1 of the Rules are provided onboard.	<p>– related with the amendment of Pt 7 Ch 5 905. 1 (1) of Guidance</p>
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Revised Guidance Relating to the Rules for the Classification of Steel Ships

(Development Review : For external opinion inquiry)

Part 7 Ships of Special Service

Chapter 5 Ships Carrying Liquefied Gases in Bulk 2020. 1.



Machinery Rule Development Team

Effective Date : 1 July 2020

(The contract date for construction)

Present	Amendment	Remark																																																
<p style="text-align: center;">CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK</p> <p style="text-align: center;">Section 1 - 9 <same as the present Rules></p> <p style="text-align: center;">Section 10 Electrical Installations</p> <p>1002. General [See Rule]</p> <p>1. Certified safe type equipment</p> <p>(1) Electrical equipment installed in hazardous areas is to be the explosion protected electrical equipment required by Pt 6, Ch 1, Sec 9 of the Rules and having the performance classified by Gases and Vapours Group and Temperature Class according to Table 7.5.9 of the Guidance by the type of vapour or equivalent.</p> <p>(2) - (3) <same as the present Rules></p> <p>Table 7.5.9 Gases and Vapours Groups and Temperature Class</p> <table border="1" data-bbox="197 976 943 1273"> <thead> <tr> <th>Product name</th> <th>UN number</th> <th>Gases and vapours groups</th> <th>Temperature class</th> </tr> </thead> <tbody> <tr> <td>Acetic aldehyde ~ Nitrogen</td> <td></td> <td><same as the present Rules></td> <td></td> </tr> <tr> <td>Propane</td> <td>1978</td> <td>II A</td> <td><u>T1</u></td> </tr> <tr> <td>Propylene ~ Vinylidene chloride</td> <td></td> <td><same as the present Rules></td> <td></td> </tr> <tr> <td colspan="4">Notes:</td> </tr> <tr> <td colspan="4">1. - 2. <same as the present Rules></td> </tr> </tbody> </table> <p style="text-align: center;">Section 11 - 19 <same as the present Rules></p>	Product name	UN number	Gases and vapours groups	Temperature class	Acetic aldehyde ~ Nitrogen		<same as the present Rules>		Propane	1978	II A	<u>T1</u>	Propylene ~ Vinylidene chloride		<same as the present Rules>		Notes:				1. - 2. <same as the present Rules>				<p style="text-align: center;">CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK</p> <p style="text-align: center;">Section 1 - 9 <same as the present Rules></p> <p style="text-align: center;">Section 10 Electrical Installations</p> <p>1002. General [See Rule]</p> <p>1. Certified safe type equipment</p> <p>(1) Electrical equipment installed in hazardous areas is to be the explosion protected electrical equipment required by Pt 6, Ch 1, Sec 9 of the Rules and having the performance classified by Gases and Vapours Group and Temperature Class according to Table 7.5.9 of the Guidance by the type of vapour or equivalent.</p> <p>(2) - (3) <same as the present Rules></p> <p>Table 7.5.9 Gases and Vapours Groups and Temperature Class (2020)</p> <table border="1" data-bbox="1021 976 1767 1273"> <thead> <tr> <th>Product name</th> <th>UN number</th> <th>Gases and vapours groups</th> <th>Temperature class</th> </tr> </thead> <tbody> <tr> <td>Acetic aldehyde ~ Nitrogen</td> <td></td> <td><same as the present Rules></td> <td></td> </tr> <tr> <td>Propane</td> <td>1978</td> <td>II A</td> <td>T1 <u>T2</u></td> </tr> <tr> <td>Propylene ~ Vinylidene chloride</td> <td></td> <td><same as the present Rules></td> <td></td> </tr> <tr> <td colspan="4">Notes:</td> </tr> <tr> <td colspan="4">1. - 2. <same as the present Rules></td> </tr> </tbody> </table> <p style="text-align: center;">Section 11 - 19 <same as the present Rules></p>	Product name	UN number	Gases and vapours groups	Temperature class	Acetic aldehyde ~ Nitrogen		<same as the present Rules>		Propane	1978	II A	T1 <u>T2</u>	Propylene ~ Vinylidene chloride		<same as the present Rules>		Notes:				1. - 2. <same as the present Rules>				<p>(Amended)</p> <p>- The temperature class of Propane has been amended from T1 to T2 according to IEC 60079-10-1.</p>
Product name	UN number	Gases and vapours groups	Temperature class																																															
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Revised Guidance Relating to the Rules for the Classification of Steel Ships

(Final)

Part 7 Ships of Special Service

Chapter 5 Ships Carrying Liquefied Gases in Bulk 2020. 1.



Machinery Rule Development Team

Effective Date : 1 January 2020

(The keels of which are laid or which are at a similar stage of construction)

● reflected IACS UI GC27(New Dec 2018)

- The requirement for maintenance for installing only one level gauge have been newly added.

Present	Amendment	Remark
<p style="text-align: center;">CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK</p> <p>Section 1 - 12 <same as the present Rules></p> <p>Section 13 Instrumentation and Automation Systems</p> <p>1301. <same as the present Rules></p> <p>1302. Level indicators for cargo tanks [See Rule]</p> <p>1. <same as the present Rules></p> <p><Newly added></p> <p>2. <same as the present Rules></p> <p>1303. - 1307. <same as the present Rules></p>	<p style="text-align: center;">CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK</p> <p>Section 1 - 12 <same as the present Rules></p> <p>Section 13 Instrumentation and Automation Systems</p> <p>1301. <same as the present Rules></p> <p>1302. Level indicators for cargo tanks [See Rule]</p> <p>1. <same as the present Rules></p> <p>2. For the purpose of the requirements in 1302. 2 of the Rules, in order to assess whether or not only one level gauge is acceptable in relation to the aforesaid sentence, the expression ‘can be maintained’ means that any part of the level gauge other than passive parts can be overhauled while the cargo tank is in service. However, passive parts are those parts assumed not subject to failures under normal service conditions. (2020)</p> <p>2. 3. <same as the present Rules></p> <p>1303. - 1307. <same as the present Rules></p>	<p>(Newly added)</p> <p>- Reflecting the IACS UI GC27(New Dec 2018), the requirement for maintenance for installing only one level gauge have been newly added.</p>

Effective Date : 1 July 2020

(The contract date for construction)

- reflected IACS UI GC29(New May 2019)

Present	Amendment	Remark
<p style="text-align: center;">CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK</p> <p>Section 1 - 12 <same as the present Rules></p> <p>Section 13 Instrumentation and Automation Systems</p> <p>1301. - 1307. <same as the present Rules></p> <p><Newly added></p>	<p style="text-align: center;">CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK</p> <p>Section 1 - 12 <same as the present Rules></p> <p>Section 13 Instrumentation and Automation Systems</p> <p>1301. - 1307. <same as the present Rules></p> <p>1309. System integration (2020) [See Rule]</p> <p>1. For the purpose of the requirements in 1309. 3 of the Rules, the expression “integrated system” means a combination of computer-based systems which are used for the control, monitoring/alarm and safety functions required for the carriage, handling and conditioning of cargo liquid and vapours and are interconnected in order to allow communication between computer-based systems and to allow centralized access to monitoring/alarm and safety information and/or command/control.</p>	<p>(Newly added)</p> <p>- Reflecting the IACS UI GC29(New May 2019), the definition and function of the integrated system have been newly added.</p>

GUIDANCE RELATING TO THE RULES FOR CLASSIFICATION OF STEEL SHIPS

(Development Review : For external opinion inquiry)

Part 7 Ships of Special Service

2019. 11.



Machinery Rule Development Team

– Main Amendments –

(1) Effective date : 1 July. 2020 (Date of which the contract for construction is signed)

● Test requirements for piping have been amended.

Present

Remark

CHAPTER 6 SHIPS CARRYING DANGEROUS CHEMICALS IN BULK

<omitted>

Section 5 Cargo Transfer

<omitted>

504. Tests requirements for piping [See Rule]

<omitted>

Table 7.6.4. Test Requirements for Piping

	Materials of pipe	Materials of valves, cocks and pipe fittings	Shop tests for pipe fabrication			Shop tests for valves and pipe fittings	Shipboard tests for piping
			Welding procedure qualification tests	Non-destructive tests	Hydraulic tests		
Class I	Materials complying, as a rule, with the requirements in Pt 2, Ch 1 of the Rules.	Materials complying, as a rule, with the requirements in Pt 2, Ch 1 of the Rules. However, materials complying with the requirements of KS or equivalent may be accepted at the discretion of the Society.	To be carried out on piping of Class I or Class II where the following ① to ③ are relevant : ① Joinings between pipes, pipes and valves, and pipes and fittings are made welding for the first time. ② When new welding method is employed. ③ When base material, type of welding materials or type of joints is changed.	① Radiographic testing for the entire length of butt-welded joints of pipes with nominal diameter exceeding 65A. ② Radiographic testing for the sampled butt-welded joints of pipes with nominal diameter not more than 65A. ③ In place of radiographic testings, suitable other non-destructive testing may be accepted. ④ Magnetic particle testing or suitable other for fillet weld of pipes.	① All pipes of Class I, Class II and Class III, steam pipes, feed pipes, compressed air pipes, fuel oil pipes of which design pressure exceeds 0.35 MPa are to be subjected to hydraulic tests with fittings attached after fabrication at a test pressure 1.5 times the design pressure. ② The test pressure for hydraulic test for pipes with design temperature exceeding 300°C is to be specified separately. ③ The hydraulic test for welded joints between pipes or pipes and valves of piping arranged onboard the ship is to be specified separately.	Valves and fittings of piping of Class I or Class II are subject to hydraulic test at a pressure of 1.5 times the design pressure.	① All pipes are subject to leak test in their service condition. ② All pipes are to be subjected to preliminary test together with the equipment they serve. ③ Fuel oil pipes and tank heating pipes are to be subjected to leak test at a pressure of 1.5 times the design pressure. However, the test pressure is to be at least 0.4MPa or more. ④ The piping of the refrigerating installation is to be subjected to the requirements specified in Pt 5, Ch 6, 1205. (4) of the Rules. ⑤ All cargo pipes are to be subjected to the hydraulic test at a pressure of 1.5 times the design pressure.
Class II				① Radiographic testing or suitable other testing for butt-welded pipes with nominal diameter exceeding 80A. ② Magnetic particle testing or suitable other testing for fillet weld of pipes.			
Class III	Materials complying with the requirements of KS or equivalent	Materials complying with the requirements of KS or equivalent					

(amendment)
- Piping not related to the cargo transfer have been deleted.
- But welded joints between pipes and valves (or cocks), and pipes and fittings have been added to non-destructive test subject.

Amendments	Remark
<p style="text-align: center;">CHAPTER 6 SHIPS CARRYING DANGEROUS CHEMICALS IN BULK</p> <p style="text-align: center;"><omitted></p> <p style="text-align: center;">Section 5 Cargo Transfer</p> <p style="text-align: center;"><omitted></p> <p>504. Tests requirements for piping [See Rule]</p> <p style="text-align: center;"><omitted></p> <p style="text-align: center;">-> To the next page</p>	<p>(amendment)</p> <p>- Piping not related to the cargo transfer have been deleted.</p> <p>- Butt welded joints between pipes and valves (or cocks), and pipes and fittings have been added to non-destructive test subject.</p>

Amendments

Remark

Table 7.6.4. Test Requirements for Piping

	Materials of pipe	Materials of valves, cocks and pipe fittings	Shop tests for pipe fabrication			Shop tests for valves and pipe fittings	Shipboard tests for piping
			Welding procedure qualification tests	Non-destructive tests	Hydraulic tests		
Class I	Materials complying, as a rule, with the requirements in Pt 2, Ch 1 of the Rules.	Materials complying, as a rule, with the requirements in Pt 2, Ch 1 of the Rules. However, materials complying with the requirements of KS or equivalent may be accepted at the discretion of the Society.	To be carried out on piping of Class I or Class II where the following ① to ③ are relevant : ① Joinings between pipes, pipes and valves, and pipes and fittings are made welding for the first time. ② When new welding method is employed. ③ When base material, type of welding materials or type of joints is changed.	① <u>Radiographic testing for the entire length of butt-welded joints between pipes, pipes and valves, and pipes and fittings with nominal diameter exceeding 65A.</u> ② <u>Radiographic testing for the sampled butt-welded joints between pipes, pipes and valves, and pipes and fittings with nominal diameter not more than 65A.</u> ③ <u>In place of radiographic testings, suitable other non-destructive testing may be accepted.</u> ④ <u>Magnetic particle testing or suitable other for fillet weld between pipes, pipes and valves, and pipes and fittings.</u>	① <u>All pipings of Class I, Class II and Class III, are to be subjected to hydraulic tests with fittings attached after fabrication at a test pressure 1.5 times the design pressure.</u> ② <u>The test pressure for hydraulic test for pipes with design temperature exceeding 300°C is to be specified separately.</u> ③ <u>The hydraulic test for welded joints between pipes or pipes and valves (or cocks) of piping arranged onboard the ship is to be specified separately.</u>	Valves (or cocks) and fittings of Class I or Class II are subject to hydraulic test at a pressure of 1.5 times the design pressure.	① <u>All pipings are subject to leak test in their service condition.</u> ② <u>All pipes are to be subjected to preliminary test together with the equipment they serve.</u> ③ <u>All cargo pipings are to be subjected to the hydraulic test at a pressure of 1.5 times the design pressure.</u>

(amendment)
- Piping not related to the cargo transfer have been deleted.
- Butt welded joints between pipes and valves (or cocks), and pipes and fittings have been added to non-destructive test subject.

Amendments

Remark

Amendments				Remark
Class II			<p>①<u>Radiographic testing or suitable other testing for buttwelded pipes joints between pipes, pipes and valves(or cocks), and pipes and fittings with nominal diameter exceeding 80A.</u></p> <p>②<u>Magnetic particle testing or suitable other testing for fillet weld between pipes, pipes and valves(or cocks), and pipes and fittings</u></p>	<p>(amendment)</p> <p>- Piping not related to the cargo transfer have been deleted.</p> <p>- Buttwelded joints between pipes and valves (or cocks), and pipes and fittings have been added to non-destructive test subject.</p>
Class III	Materials complying with the requirements of KS or equivalent	Materials complying with the requirements of KS or equivalent		

Present	Amendments	Remark
<p align="center">CHAPTER 6 SHIPS CARRYING DANGEROUS CHEMICALS IN BULK <omitted> Section 8 Cargo Tank Venting and Gas-freeing Arrangements</p> <p>802. Cargo tank venting <omitted></p> <p>3. Provision to protect liquefied head exceeding design head [See Rule] <omitted></p> <p>(3) The system fitted with valves and flanges for connecting cargo hoses at hatches on the top of cargo tank for preventing cargo tank overpressure as given in Fig 7.6.35 of the Guidance may be accepted only when either of the following (A) or (B) is relevant :</p> <p align="center"><omitted></p> <p>(B) Where method of cargo transfer to other cargo tanks has been established. In this case, however, cargo loading may be restricted under the requirements for mutual reaction with each other. In either case of (A) or (B), much difficulty is involved in observing the operational restrictions and hence it is desirable to install the high level alarm or overflow control system specified in 1519 of the Rules. For tanks carrying the cargo with a flash point of not more than 60°C, provision of the high level alarm system or overflow control system conforming to Pt 8, Ch 3, 505. 3 (1) of the Rules is required where spill valves are not to be used. (Spill valves are not deemed equivalent.) <omitted></p>	<p align="center">CHAPTER 6 SHIPS CARRYING DANGEROUS CHEMICALS IN BULK <same as present> Section 8 Cargo Tank Venting and Gas-freeing Arrangements</p> <p>802. Cargo tank venting <same as present></p> <p>3. Provision to protect liquefied head exceeding design head [See Rule] <same as present></p> <p>(3) The system fitted with valves and flanges for connecting cargo hoses at hatches on the top of cargo tank for preventing cargo tank overpressure as given in Fig 7.6.35 of the Guidance may be accepted only when either of the following (A) or (B) is relevant :</p> <p align="center"><same as present></p> <p>(B) Where method of cargo transfer to other cargo tanks has been established. In this case, however, cargo loading may be restricted under the requirements for mutual reaction with each other. In either case of (A) or (B), much difficulty is involved in observing the operational restrictions and hence it is desirable to install the high level alarm or overflow control system specified in 1519 of the Rules. For tanks carrying the cargo with a flash point of not more than 60°C, provision of the high level alarm system or overflow control system conforming to Pt 8, Ch 9, 503. 1 of the Rules is required where spill valves are not to be used. (Spill valves are not deemed equivalent.) <same as present></p>	<p>(amendment) - Quoted requirement of Rule Part 8 has been amended as revised Rule Part 8.</p>

GUIDANCE RELATING TO RULES FOR CLASSIFICATION OF STEEL SHIPS

(Development Review : External Opinion Inquiry)

Part 7 Chapter 5 Ships Carrying Liquefied Gases in Bulk

2020. 03.



Machinery Rule Development Team

– Main Amendments –

(1) Annex 7A–3 LNG Bunkering Systems

- To clarify that application of Annex 7A–3 LNG Bunkering Systems is optional
- To clarify that portable radios are subject to means of voice communication
- To describe requirements for alarm and ESD conditions in the table and delete impractical conditions.

Present	Amendment	Reason
<p data-bbox="163 185 922 225">Annex 7A-3 LNG Bunkering Systems</p> <p data-bbox="389 304 696 336">Section 1 General</p> <p data-bbox="156 384 380 411">101. Application</p> <ol data-bbox="183 432 934 632" style="list-style-type: none"><li data-bbox="183 432 934 587">1. <u>This</u> Annex applies to ships carrying liquefied gas in bulk fitted with systems for delivering LNG bunker to ships using LNG as fuel. This Annex also applies to a ship carrying liquefied gas in bulk transferring LNG cargo to another ships carrying liquefied gas in bulk.<li data-bbox="183 603 338 632">2. <omitted> <p data-bbox="264 735 822 767">Section 2 to Section 4 <omitted></p> <p data-bbox="224 826 866 890">Section 5 Arrangements and Design of Bunkering Systems</p> <p data-bbox="154 935 477 962">501. to 508. <omitted></p> <p data-bbox="156 1018 562 1045">509. Communication systems</p> <ol data-bbox="183 1070 934 1345" style="list-style-type: none"><li data-bbox="183 1070 934 1190">1. A communication system is to be provided between the bunkering facility and the receiving ship and be provided with back-up. This may be achieved by electric, fibre-optic or pneumatic links, or a combination of these systems.<li data-bbox="183 1209 934 1267">2. The components of the communication system located in hazardous area are to be of certified safe type.<li data-bbox="183 1286 934 1345">3. Where portable radios are used for <u>communication</u>, they are to be of certified safe type for hazardous area.	<p data-bbox="945 185 1704 225">Annex 7A-3 LNG Bunkering Systems</p> <p data-bbox="1171 304 1478 336">Section 1 General</p> <p data-bbox="940 384 1162 411">101. Application</p> <ol data-bbox="967 432 1715 663" style="list-style-type: none"><li data-bbox="967 432 1715 619">1. <u>At the request of the owner, the requirements in this</u> Annex applies to ships carrying liquefied gas in bulk fitted with systems for delivering LNG bunker to ships using LNG as fuel. This Annex also applies to a ship carrying liquefied gas in bulk transferring LNG cargo to another ships carrying liquefied gas in bulk.<li data-bbox="967 636 1265 663">2. <same as the present> <p data-bbox="940 735 1709 767">Section 2 to Section 4 <same as the present></p> <p data-bbox="1003 826 1646 890">Section 5 Arrangements and Design of Bunkering Systems</p> <p data-bbox="936 935 1444 962">501. to 508. <same as the present></p> <p data-bbox="938 1018 1346 1045">509. Communication systems</p> <ol data-bbox="967 1070 1715 1345" style="list-style-type: none"><li data-bbox="967 1070 1715 1190">1. A communication system is to be provided between the bunkering facility and the receiving ship and be provided with back-up. This may be achieved by electric, fibre-optic or pneumatic links, or a combination of these systems.<li data-bbox="967 1209 1715 1267">2. The components of the communication system located in hazardous area are to be of certified safe type.<li data-bbox="967 1286 1715 1345">3. Where portable radios are used for <u>voice communication</u>, they are to be of certified safe type for hazardous area.	<p data-bbox="1749 432 2031 592">– To clarify that application of Annex 7A-3 LNG Bunkering Systems is optional</p> <p data-bbox="1715 1246 2054 1406">– To clarify that portable radios are subject to means of voice communication</p>

Present	Amendment	Reason																																	
<p align="center">Section 6 Control, Monitoring and Safety Systems</p> <p>601. General</p> <p>1. to 3. <omitted></p> <p>4. Safety function for parameter monitored during bunkering operation is to be in accordance with 602. 2, 3 and 603. 1.</p>	<p align="center">Section 6 Control, Monitoring and Safety Systems</p> <p>601. General</p> <p>1. to 3. <same as the present></p> <p>4. Safety function for parameter monitored during bunkering operation is to be in accordance with Table 1.</p> <p>Table 1 Alarms and ESD actions during bunkering operation</p> <table border="1" data-bbox="860 515 1731 1214"> <thead> <tr> <th>Parameters</th> <th>Alarm</th> <th>Activation of ESD system</th> </tr> </thead> <tbody> <tr> <td>High level in the receiving tank</td> <td>● 1)</td> <td>●</td> </tr> <tr> <td>LNG leakage in manifold area</td> <td>●</td> <td>●</td> </tr> <tr> <td>Gas detection in the ducting around the bunkering lines at 30% LEL</td> <td>●</td> <td></td> </tr> <tr> <td>Gas detection in the ducting around the bunkering lines at 60% LEL</td> <td>●</td> <td>●</td> </tr> <tr> <td>Gas detection in enclosed cargo machinery spaces at 30% LEL</td> <td>●</td> <td></td> </tr> <tr> <td>Gas detection in enclosed cargo machinery spaces at 60% LEL</td> <td>●</td> <td>●</td> </tr> <tr> <td>Manual or automatic activation of the emergency shutdown system</td> <td>●</td> <td>●</td> </tr> <tr> <td>Manual or automatic activation of the emergency release system</td> <td>●</td> <td>●</td> </tr> <tr> <td>Safe working envelope of the loading arm exceeded</td> <td>●</td> <td>●</td> </tr> <tr> <td>Electrical power failure</td> <td>●</td> <td>●</td> </tr> </tbody> </table> <p>Note: 1) Signal need not indicate the event initiating ESD.</p>	Parameters	Alarm	Activation of ESD system	High level in the receiving tank	● 1)	●	LNG leakage in manifold area	●	●	Gas detection in the ducting around the bunkering lines at 30% LEL	●		Gas detection in the ducting around the bunkering lines at 60% LEL	●	●	Gas detection in enclosed cargo machinery spaces at 30% LEL	●		Gas detection in enclosed cargo machinery spaces at 60% LEL	●	●	Manual or automatic activation of the emergency shutdown system	●	●	Manual or automatic activation of the emergency release system	●	●	Safe working envelope of the loading arm exceeded	●	●	Electrical power failure	●	●	<p>- To describe requirements for alarm and ESD conditions in the table</p> <p>- To delete impractical conditions for ESD link with receiving ship</p> <p>- To clarify that signal need not indicate the event initiating ESD for high level in the receiving tank</p>
Parameters	Alarm	Activation of ESD system																																	
High level in the receiving tank	● 1)	●																																	
LNG leakage in manifold area	●	●																																	
Gas detection in the ducting around the bunkering lines at 30% LEL	●																																		
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Electrical power failure	●	●																																	

Present	Amendment	Reason
<p>602. Monitoring, alarm and control systems</p> <p>1. Visible and audible alarms are to be provide on bunkering control station.</p> <p>2. Alarms are to be activated <u>in the following cases.</u></p> <p>(1) <u>Low pressure in the supply tank</u></p> <p>(2) <u>Sudden pressure drop at the transfer pump discharge</u></p> <p>(3) <u>High level in the receiving tank</u></p> <p>(4) <u>High pressure in the receiving tank</u></p> <p>(5) <u>LNG leakage in manifold area</u></p> <p>(6) <u>Gas detection in the ducting around the bunkering lines at 30% LEL</u></p> <p>(7) <u>Gas detection in enclosed cargo machinery spaces at 30% LEL</u></p> <p>(8) <u>Manual or automatic activation of the emergency shutdown system</u></p> <p>(9) <u>Manual or automatic activation of the emergency release system</u></p> <p>(10) <u>Safe working envelope of the loading arm exceeded</u></p> <p>(11) <u>Fire detection on receiving ship or bunkering ship</u></p> <p>(12) <u>Electrical power failure</u></p> <p>3. Where transfer arms are used as transfer systems, in addition to Par. 2, the followings are be complied with.</p> <p>(1) A system of constant monitoring of the position of arms is to be installed to provide real time information to the operator and receiving ship.</p> <p>(2) For the hydraulic systems of the transfer arm, visible and audible alarms are to be activated in the following cases.</p> <p>(A) low pressure in hydraulic accumulators;</p> <p>(B) abnormal pressure in actuators chambers;</p> <p>(C) low oil level in tank;</p> <p>(D) low nitrogen pressure in accumulators.</p>	<p>602. Monitoring, alarm and control systems</p> <p>1. Visible and audible alarms are to be provide on bunkering control station.</p> <p>2. Alarms are to be activated <u>in accordance with 601. 4, Table 1.</u></p> <p>3. Where transfer arms are used as transfer systems, in addition to 601. 4, Table 1, the followings are be complied with.</p> <p>(1) A system of constant monitoring of the position of arms is to be installed to provide real time information to the operator and receiving ship.</p> <p>(2) For the hydraulic systems of the transfer arm, visible and audible alarms are to be activated in the following cases.</p> <p>(A) low pressure in hydraulic accumulators;</p> <p>(B) abnormal pressure in actuators chambers;</p> <p>(C) low oil level in tank;</p> <p>(D) low nitrogen pressure in accumulators.</p>	<p>- To describe requirements for alarm and ESD conditions in the table</p>

Present	Amendment	Reason
<p>603. Emergency shutdown systems</p> <p><u>1. Emergency shutdown system is to safely stop and isolate the bunker transfer between bunkering ship and receiving ship in the following cases:</u></p> <ul style="list-style-type: none"> <u>(1) Low pressure in the supply tank</u> <u>(2) Sudden pressure drop at the transfer pump discharge</u> <u>(3) High level in the receiving tank</u> <u>(4) High pressure in the receiving tank</u> <u>(5) LNG leakage in manifold area</u> <u>(6) Gas detection in the ducting around the bunkering lines at 60% LEL</u> <u>(7) Gas detection in enclosed cargo machinery spaces at 60% LEL</u> <u>(8) Manual or automatic activation of the emergency shutdown system</u> <u>(9) Manual or automatic activation of the emergency release system</u> <u>(10) Safe working envelope of the loading arm exceeded</u> <u>(11) Fire detection on receiving ship or bunkering ship</u> <u>(12) Electrical power failure</u> <p>2. to 7. <omitted></p>	<p>603. Emergency shutdown systems</p> <p><u>1. ESD actions during bunkering operation is to be in accordance with 601. 4, Table 1. Emergency shutdown system is to safely stop and isolate the bunker transfer between bunkering ship and receiving ship.</u></p> <p>2. to 7. <same as the present></p>	<p>- To describe requirements for alarm and ESD conditions in the table</p>