RUSSIAN MARITIME REGISTER OF SHIPPING

CIRCULAR LETTER **No. 314-04-1777c** dated 26.05.2022

Re:

amendments to the Rules for the Classification and Construction of Ships Carrying Liquefied Gases in Bulk, 2022, ND No. 2-020101-157-E, in connection with coming into force of IACS Unified Requirement (UR) W1 (Rev.4 Apr 2021)

Item(s) of supervision:

materials and welding

Entry-into-force date:
01.07.2022

~~Cancels/amends/adds Circular Letter No.~~ ~~dated~~

Number of pages: 1 + 5

Appendices:

Appendix 1: information on amendments introduced by the Circular Letter

Appendix 2: text of amendments to part IX "Materials and Welding"

Director General Konstantin G. Palnikov

Text of CL:

We hereby inform that the Rules for the Classification and Construction of Ships Carrying Liquefied Gases in Bulk shall be amended as specified in Appendix hereto.

It is necessary to do the following:

1. Bring the content of the Circular Letter to the notice of the RS surveyors, as well as interested organizations and persons in the area of the RS Branch Offices' activity.
2. Apply the provisions of the Circular Letter when performing technical supervision during manufacture of materials for ships contracted for construction or conversion on or after 01.07.2022*, in the absence of the contract, in accordance with 5.10, Part II "Technical Documentation" of the Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships, starting from 01.07.2022.

* Refer to the definition of the "Date of contract for construction of a ship (series of ships)" given in 1.1.2 of Part I "Classification" of the Rules for Classification and Construction of Sea-Going Ships.

List of amended and/or added paras/chapters/sections:

Rules for the Classification and Construction of Ships Carrying Liquefied Gases in Bulk:
Part IX: Tables 2.1-1, 2.1-2 and 2.1-3

Person in charge: M.E. Yurkov 314 +7 (812) 314-07-34

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Appendix 1 to Circular Letter
No. 314-04-1777c dated 26.05.2022

Information on amendments introduced by the Circular Letter
(for inclusion in the Revision History to the RS Publication)

No.	Amended paras/chapters/sections	Information on amendments	No. and date of the Circular Letter introducing the amendments	Entry-into-force date
1	Table 2.1-1	Requirements for testing of semi-finished products have been specified considering IACS UR W1 (Rev.4 Apr 2021)	314-04-1777c of 26.05.2022	01.07.2022
2	Table 2.1-2	Requirements for testing of semi-finished products have been specified considering IACS UR W1 (Rev.4 Apr 2021)	314-04-1777c of 26.05.2022	01.07.2022
3	Table 2.1-3	Requirements for testing of semi-finished products have been specified considering IACS UR W1 (Rev.4 Apr 2021)	314-04-1777c of 26.05.2022	01.07.2022

RULES FOR THE CLASSIFICATION AND CONSTRUCTION OF SHIPS CARRYING LIQUEFIED GASES IN BULK, 2022,

ND No. 2-020101-157-E

PART IX. MATERIALS AND WELDING

2 MATERIAL REQUIREMENTS

1 **Table 2.1-1** is replaced by the text reading as follows:

"Table 2.1-1

Plates, pipes (seamless and welded[1]), sections and forgings for cargo tanks, fuel tanks and process pressure vessels for design temperatures not lower than 0 °C	
Chemical composition Carbon-manganese steel. Fully killed. Fine grain steel. Chemical composition of the steel shall comply with the requirements of national/international standard or manufacture's specification approved by the Register.	
Heat treatment Normalized, or quenched and tempered[2]	
Tensile and charpy V-notch impact test	
Plates	Each piece shall be tested
Sections and forgings	Each batch shall be tested
Tensile properties	Specified minimum yield stress not exceeding 410 MPa[3]
Charpy V-notch impact test	
Plates	Transverse specimens
	Minimum average energy value (KV) 27 J
Sections and forgings	Longitudinal specimens
	Minimum average energy value (KV) 41 J
Impact test temperature	
Thickness *t*, in mm	Test temperature, in °C
$t \leq 20$	0
$20 < t \leq 40$	–20
$40 < t \leq 50$[4]	–20[5]
$40 < t \leq 50$[4]	–30[6]

[1] For seamless pipes and fittings in compliance with the requirements of the Rules for the Classification and Construction. Charpy V-notch impact tests are not required for pipes.

[2] A controlled rolling procedure or TMCP may be used as an alternative provided the properties specified in the Rules are guaranteed by the manufacturer.

[3] Hardness of the weld and heat affected zones shall meet the approved international and/national standards and norms.

[4] For semi-finished products of *t* > 40 mm in thickness, testing of a further set of samples taken from mid-thickness is required. This requirement does not apply to normal, higher and high strength rolled steel complying with the requirements of the RS rules and specified in 3.2 and 3.13, Part XIII "Materials" of the Rules for the Classification and Construction of Sea-Going Ships.

[5] Applies to independent tanks of C type and process pressure vessels. Post-weld stress relief heat treatment shall be performed. Exemption to post-weld stress relief heat treatment based on an alternative approach (e.g., engineering-critical assessment) shall be to agreed standards or may be individually agreed with the Register.

[6] Applies to cargo or fuel tanks except of those of C type.

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2 **Table 2.1-2** is replaced by the text reading as follows:

"Table 2.1-2

Plates, sections and forgings[1] for cargo tanks, secondary barriers and process pressure vessels for design temperatures below 0 °C and down to –55 °C. Maximum thickness[2] 25 mm

Chemical composition

Carbon-manganese steel. Fully killed. Aluminium treated fine grain steel. Chemical composition (ladle analysis), %:

C	Mn	Si	S	P
0,16 max[3]	0,70 — 1,60	0,10 — 0,50	0,025 max	0,025 max

Alloys and grain refining elements may be generally in accordance with the following, %:

Ni	Cr	Mo	Cu	Nb	V	Al
0,80 max	0,25 max	0,08 max	0,35 max	0,05 max	0,10 max	0,02 min

Heat treatment

Normalized or quenched and tempered[4]

Tensile and Charpy V-notch impact test

Plates	Each piece shall be tested
Sections and forgings	Each batch shall be tested
Tensile properties	Specified minimum yield stress not exceeding 410 MPa[5]

Charpy V-notch impact test

Plates	Transverse specimens
	Minimum average impact energy value *KV* 27 J
Sections and forgings[1]	Longitudinal specimens
	Minimum average impact energy value *KV* 41 J

Charpy V-notch impact test temperature

5 °C below design temperature or –20 °C, whichever is lower

[1] Chemical composition of forgings shall comply with the specification approved by the Register.

[2] For material thickness more than 25 mm thick, Charpy V-notch impact tests shall be conducted as follows:

Material thickness *t*, in mm	Test temperature, in °C
25 < *t* ≤ 30	10 °C below design temperature or –20 °C, whichever is lower
30 < *t* ≤ 35	15 °C below design temperature or –20 °C, whichever is lower
35 < *t* ≤ 40	20 °C below design temperature

The Charpy V-notch impact energy value shall be in accordance with the table for the applicable type of test specimen.

Materials for tanks and parts of tanks which are completely thermally stress relieved after welding may be tested at a temperature 5 °C below design temperature or –20 °C, whichever is lower.

For thermally stress relieved reinforcements and other fittings, the test temperature shall be the same as that required for the adjacent tankshell thickness.

[3] Carbon content may be increased to 0,18 maximum provided the design temperature is not lower than –40 °C.

[4] A controlled rolling procedure or TMCP may be used as an alternative to normalizing or quenching and tempering, provided the properties specified in the LG Rules are guaranteed by the manufacturer. For materials exceeding 25 mm in thickness for which the test temperature is –60 °C or lower, the application of specially treated steel or steels in accordance with Table 2.1-3 shall be stipulated by the LG Rules.

[5] Hardness of the weld and heat affected zones shall meet the approved international and/national standards and norms.

Plates, sections and forgings for cargo tanks, secondary barriers and process pressure vessels for design temperatures below 0 °C and strictly down to –10 °C. Thickness above 40 mm.
Requirements for Charpy V-notch impact bend testing.

	Thickness t, in mm	Test temperature, in °C
Test temperature	40 < *t* ≤ 50[6]	5 °C below design temperature or – 20 °C, whichever is lower[7]
	40 < *t* ≤ 50[6]	25 °C below design temperature[8]
	40 < *t* ≤ 50[6]	30 °C below design temperature[8]

[6] For semi-finished products of *t* > 40 mm in thicknessб testing of a further set of samples taken from mid-thickness is required. This requirement does not apply to normal, higher and high strength rolled steel complying with the requirements of the RS rules and specified in 3.2 and 3.13, Part XIII "Materials" of the Rules for the Classification and Construction of Sea-Going Ships.

[7] Applies to independent tanks of C type and process pressure vessels. Post-weld stress relief heat treatment shall be performed. Exemption to post-weld stress relief heat treatment based on an alternative approach (e.g., engineering-critical assessment) shall be to agreed standards or may be individually agreed with the Register.

[8] Applies to cargo or fuel tanks except of those of C type.

Plates, sections and forgings for cargo tanks, secondary barriers and process pressure vessels for design temperatures below –10 °C and down to –55 °C. Thickness above 40 mm. Requirements for Charpy V-notch impact bend testing.		
Test temperature	Thickness *t*, in mm	Test temperature, in °C
	40 < *t* ≤ 50[9]	5 °C below design temperature or –20 °C, whichever is lower[10]
	40 < *t* ≤ 50[9]	25 °C below design temperature[11]
	40 < *t* ≤ 50[9]	30 °C below design temperature[11]

[9] For semi-finished products on *t* > 40 mm in thickness, testing of a further set of samples taken from mid-thickness is required. This requirement does not apply to the rolled steel of normal, higher and high strength complying with the requirements of the RS rules and specified in 3.2 and 3.13, Part XIII "Materials" of the Rules for the Classification and Construction of Sea-Going Ships.

[10] For post-weld stress relief heat treatment requirements of 6.6.2.2 of the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk shall apply Post-weld stress relief heat treatment shall be performed. Exemption to post-weld stress relief heat treatment based on an alternative approach (e.g., engineering-critical assessment) shall be to agreed standards or may be individually agreed with the Register.

[11] Applies to cargo or fuel tanks except of those of C type.

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3 **Table 2.1-3** is replaced by the text reading as follows:

"Table 2.1-3

Plates, sections and forgings for cargo tanks, secondary barriers and process pressure vessels for design temperatures[1] below –55 °C and down to –165 °C. Maximum thickness[2] 25 mm		
Minimum design temperature, in °C	Chemical composition[3] and heat treatment	Charpy V-notch impact test temperature, °C
–60	1,5 % nickel steel N or N+T or Q+T or TMCP	–65
–65	2,25 % nickel steel N or N+T or Q+T or TMCP[4]	–70
–90	3,5 % nickel steel N or N+T or Q+T or TMCP[4]	–95
–105	5 % nickel steel N or N+T or Q+T[4, 5]	–110
–165	9 % nickel steel N+N+T or Q+T	–196
–165	Austenitic steels such types* 304, 304L, 316, 316L, 321 and 347 Solution treated	–196
–165	Aluminium alloys type* 5083, 1550, 1565ch Annealed	Not required
–165	Austenitic Fe – Ni alloy (36 % Ni)	Not required
Tensile and Charpy V-notch impact test		
Plates	Each piece shall be tested	
Sections and forgings	Each batch shall be tested	
Charpy V-notch impact test		
Plates	Transverse specimens	
	Minimum average energy value *KV* 27 J	
Sections and forgings	Longitudinal specimens	
	Minimum average energy value *KV* 41 J	

[1] The requirements for materials use at design temperatures below –165 °C shall comply with the values specified in the national/ international standards.

[2] For steel 1.5%; 2.25%; 3.5% and 5% Ni, with thickness greater than 25 mm, the Charpy V-notch impact test temperature shall be corrected as follows:

Material thickness *t*, in mm	Test temperature, in °C
25 < *t* ≤ 30	10 °C below design temperature
30 < *t* ≤ 35	15 °C below design temperature
35 < *t* ≤ 40	20 °C below design temperature

The Charpy V-notch impact energy value shall be in accordance with the table for the applicable type of test specimen.

[3] The chemical composition limits shall comply with the approved specification.

[4] A lower minimum design temperature for quenched and tempered steels may be permitted.

[5] A specially heat treated, for example triple heat treated 5% nickel steel may be used down to –165 °C, provided that the Charpy V-notch impact tests are carried out at –196 °C.

* In compliance with the international and national standards.

Plates, sections and forgings for cargo tanks, secondary barriers and process pressure vessels for design temperatures[1] below –55 °C and down to –165 °C. Thickness above 40 mm Requirements for Charpy V-notch impact bend testing.	
40 < *t* ≤ 45[6] mm	25 °C below design temperature
45 < *t* ≤ 50[6] mm	30 °C below design temperature
[6] For semi-finished products of *t* > 40 mm in thickness, testing of a further set of samples taken from mid-thickness is required. This requirement does not apply to normal, higher and high strength rolled products complying with the requirements of the RS rules and specified in 3.2 and 3.13, Part XIII "Materials" of the Rules for the Classification and Construction of Sea-Going Ships.	

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