РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА

HEAD OFFICE

CIRCULAR LETTER **No.**313-07-691c dated 30.10.2013

Re:

Amendments to the requirements to the power of main machinery in the Rules for the Classification and Construction of Sea-Going Ships, 2013, ND No. 2-020101-072(-E)

Item of technical supervision:

SHIPS PROJECTS

Implementation since	Upon receipt
Valid: till	
Validity period extended till	
Cancels/amends/adds Circular letter №	- dated -
Number of pages:	1+4
Appendices:	Amendments to Part I "Classification" and Part VII "Machinery Installations" of the Rules for the Classification and Construction of Sea-Going Ships, 2013, ND No. 2-020101-072(-E)

Head of Directorate V.I. Evenko

Amends Rules for the Classification and Construction of Sea-Going Ships, 2013, ND No. 2-020101-072(-E)

We hereby inform you that

1. In Part I "Classification" of the Rules for the Classification and Construction of Sea-Going Ships new para. 3.2.8.5.12 has been introduced, which text is given in the Appendix to the Circular Letter;

2. In Part VII "Machinery Installations" of the Rules for the Classification and Construction of Sea-Going Ships the amendments to para. 2.1.1, shall be introduced, which are given in the Appendix to the Circular Letter.

It is necessary to do the following:

1. Familiarize the surveyors of the RHO Locations/RS Branch Offices and the interested organizations within the area of the RS Branch Offices' activity with the content of the Circular Letter.

2. Consider in work.

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Appendix to Circular Letter №313-07-691c 30.10.2013г.

PART I. CLASSIFICATION

3.2 PLAN APPROVAL DOCUMENTATION

Chapter 3.2 shall be supplemented with new para 3.2.8.5.12 reading as follows:

"**.5.12** calculation of power of the main machinery for ice ships of **Ice2** – **Arc9** categories in compliance with the requirements of 2.1, Part VII "Machinery Installations" to the minimum value of power delivered to the propeller shafts of the ships.".

PART VII. MACHINERY INSTALLATIONS

2.1 POWER OF MAIN MACHINERY

Para. 2.1.1 shall be amended to read:

"**2.1.1** The requirements to the minimum required power P_{min} delivered to the propeller shaft of icebreakers and ice ships are given in 2.1.1.1 – 2.1.1.4 depending on their category.

2.1.1.1 The minimum required power delivered to the propeller shaft of icebreakers shall be consistent with their category according to 2.2.3, Part I "Classification".

2.1.1.2 The minimum required power delivered to the propeller shaft of ice ships of non-arctic categories **Ice2** and **Ice3** shall not be less than any of the values determined according to 2.1.1.3 and 2.1.1.4.

The minimum required power delivered to the propeller shaft of ice ships of arctic category **Arc4** shall not be less than the lesser of values determined according to 2.1.1.3 and 2.1.1.4.

The minimum required power delivered to the propeller shaft of ice ships of categories **Arc5** – **Arc9** shall be determined according to 2.1.1.3.

2.1.1.3 Power P_{min}, kW, shall be determined by the formula

$$P_{min} = f_1 f_2 f_3 (f_4 \Delta + P_0) \qquad (2.1.1.3)$$

where $f_1 = 1,0$ – for fixed pitch propellers;

$f_1 = 0,9$ – for propulsion plants with controllable pitch propeller or electric drive;

$f_2 = \varphi/200 + 0,675$, but not more than 1,1;

φ – slope of stem (refer to 3.10.1.2, Part II "Hull");

$f_2 = 1,1$ – for a bulbous stem; the product $f_1 f_2$ shall be taken in all cases not less than 0,85;

$f_3 = 1,2B/\sqrt[3]{\Delta}$, but not less than 1,0;

B – breadth of the ship, m;

Δ – ship's displacement to the summer load waterline (refer to 1.2.1, Part III "Equipment, Arrangements and Outfit", t. When calculating for the ice ships of **Ice2** and **Ic e3** categories Δ need not be taken more than 80000 t;

f_4 and P_0 are given in the Table 2.1.1.3.

Irrespective of the results obtained in calculating the power as per Formula (2.1.1.3), the minimum power, kW, shall not be less than:

10000 – for ice category **Arc9**;

7200 – for ice category **Arc8**;

5000 – for ice category **Arc7**;
3500 – for ice category **Arc6**;
2600 – for ice category **Arc5**;
1000 – for ice category **Arc4**;
740 – for ice categories **Ice3** and **Ice2**.

2.1.1.4 The power P_{min}, kW, shall be determined as the maximum value calculated for the upper ice waterline (UIWL) and lower ice waterline (LIWL) as indicated in 1.1.3, Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particular of Ships" as per the formula

$$P_{\min} = K_e \frac{\left(R_{CH}/1000\right)^{3/2}}{D_P} \qquad (2.1.1.4\text{-}1)$$

where K_e = coefficient given in Table 2.1.1.4;

R_{CH} = parameter determined as per the formula

$$R_{CH} = 845 \cdot C_\mu \cdot \left(H_F + H_M\right)^2 \cdot \left(B + C_\psi \cdot H_F\right) + 42 \cdot L_{PAR} \cdot H_F{}^2 + 825 \cdot \left(\frac{L \cdot T}{B^2}\right)^3 \cdot \frac{A_{wf}}{L} \qquad (2.1.1.4\text{-}2)$$

where $C_\mu = 0{,}15\cos\varphi_2 + \sin\psi/\sin\alpha$, but not less than 0,45;

$H_F = 0{,}26 + (H_M B)^{0{,}5}$;

H_M = 1,0 for ice category **Arc4**;

H_M = 0,8 for ice category **Ice3;**

H_M = 0,6 for ice category **Ice2**;

B = maximum breadth of the ship, m;
$C_\psi = 0{,}047\psi - 2{,}115$, $C_\psi = 0$ at $\psi < 45°$;
L_{PAR} = length of the parallel midship body, m;
L = length of the ship between the perpendiculars, m;
T = draught at UIWL or LIWL, m;
A_{wf} = area of the waterline of the bow, m^2;
α = angle of the waterline at B/4, degree;
φ_1 = rake of the stem at the centreline, degree;
$\varphi_1 = 90°$ for a ship with a bulbous bow;
φ_2 = rake of the bow at B/4, degree;
$\psi = \arctan(\tan\varphi_2/\sin\alpha)$;
D_p = diameter of the propeller, m;
L_{BOW} = length of the bow, m.

The value $\left(\frac{L \cdot T}{B^2}\right)^3$ shall be taken within the range $5 < \left(\frac{L \cdot T}{B^2}\right)^3 < 20$.

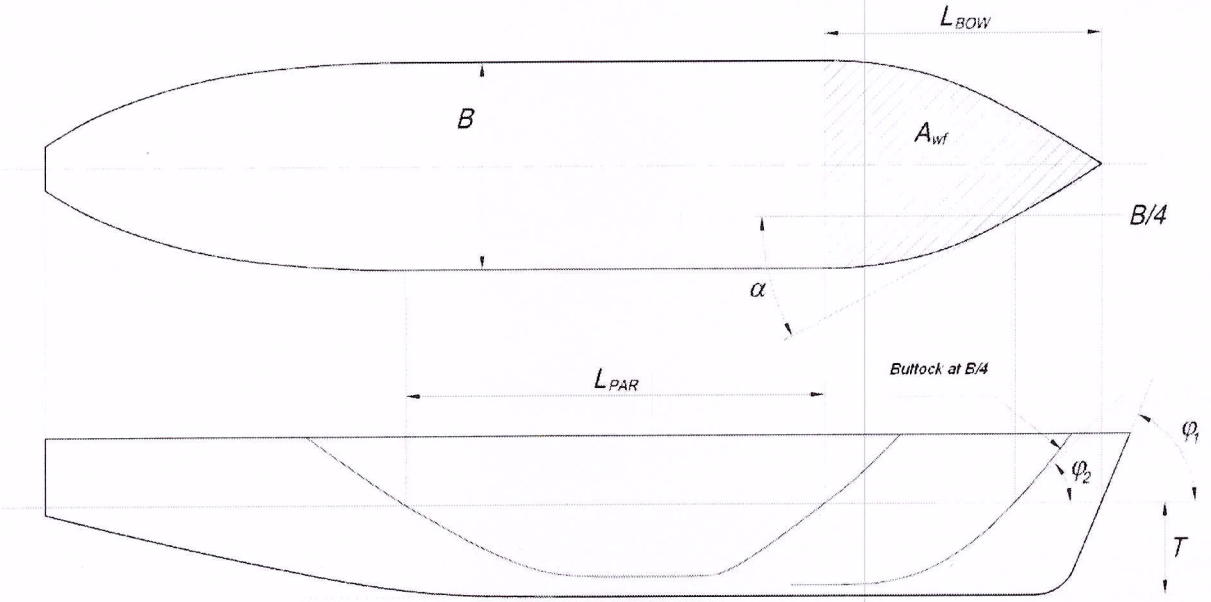

Fig. 2.1.1.4 Geometrical features of the ship for determination of the power delivered to the propeller shaft of ice ships

Formula 2.1.1.4.1 may be used when the conditions given in Table 2.1.1.4-2 are fulfilled.

Table 2.1.1.4-1

Values of coefficient K_e

Number of propellers	Propulsion plant with controllable pitch propeller or electric drive	Propulsion plant with fixed pitch propeller
1	2,03	2,26
2	1,44	1,60
3	1,18	1,31

Table 2.1.1.4-2

Applicability conditions of Formula 2.1.1.4.1

Parameter	Minimum value	Maximum value
α, degree	15	55
φ_1, degree	25	90
φ_2, degree	10	90
L, m	65,0	250,0
B, m	11,0	40,0
T, m	4,0	15,0
L_{BOW}/L	0,15	0,40
L_{PAR}/L	0,25	0,75
D_P/T	0,45	0,75
$A_{wf}/(L \cdot B)$	0,09	0,27

2.1.1.5 In well-grounded cases the minimum power values may be reduced. These cases are subject to special consideration by the Register.".

Table 2.1.1 shall be renumbered 2.1.1.3.