



# RUSSIAN MARITIME REGISTER OF SHIPPING

**CIRCULAR LETTER**

**No. 371-05- 1022c**

**dated 09.06.2017**

Re:

amendments to the Rules for the Classification and Construction of Ships Carrying Liquefied Gases in Bulk, 2016, as regards the requirements to determine the dynamic design loads on the walls of a cargo tank at its partial filling due to the sloshing effects

Item of technical supervision:

Sea-going ships under construction

Implementation from the date of publication

Valid: till -

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~~Cancels / amends / supplements Circular Letter~~ - dated -  
No.

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Appendices: text of amendments to Part IV "Cargo Tanks" of the Rules for the Classification and Construction of Ships Carrying Liquefied Gases in Bulk, 2016, ND No. 2-020101-093-E

Director General

K.G. Palnikov

Amends Rules for the Classification and Construction of Ships Carrying Liquefied Gases in Bulk, 2016, ND No. 2-020101-093-E

We hereby inform of amendments to Part IV "Cargo Tanks" of the Rules for the Classification and Construction of Ships Carrying Liquefied Gases in Bulk, 2016, ND No. 2-020101-093-E regarding the requirements to determine the dynamic design loads on the walls of a membrane cargo tank at its partial filling due to the sloshing effects.

It is necessary to do the following:

1, Familiarize surveyors of the RS Branch Offices and interested organizations in the area of the RS Branch Offices' activity with the content of the Circular Letter.

2, Apply provisions of the Circular Letter during the RS practical activity.

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**RULES FOR THE CLASSIFICATION AND CONSTRUCTION OF SHIPS CARRYING  
LIQUIFIED GASES IN BULK, 2016,  
ND No. 2-020101-093-E**

**PART IV. CARGO TANKS**

**3 DESIGN LOADS**

**Para 3.6** shall be supplemented with the following text:

“For membrane cargo tanks the functional requirements to determine methodology of dynamic design loads on the walls of a cargo tank at its partial filling due to the sloshing effects are given in 3.9.7.”.

**Para 3.9.7** shall be introduced reading as follows:

**“3.9.7** Methodology to determine dynamic design loads on the walls of a membrane cargo tank at its partial filling due to the sloshing effects shall comply with the following minimum functional requirements:

**.1** methodology shall contain the data on source specifications describing the operation during the whole ship's service life, including:

the ship's main particulars;

geometry of cargo tanks at the primary barrier level, arrangement of cargo containments over the full breadth and length;

density and kinematic viscosity values;

selected design levels for tank filling;

the ship speed and distribution law of heading;

characteristics of ship's loading conditions (the centre of gravity and centre of buoyancy position, metacentric height);

statistics on irregular sea parameters (the provisions of IACS Recommendation No. 34 shall be met);

special service conditions, if available (ice class);

**.2** in general, the loads shall be determined for all the cargo tanks where the partial filling is provided.

In case of the available tanks identical in terms of geometrical features, it is allowed to determine the loads for those tanks where the maximum sloshing loads are expected. In addition, the methodology shall contain substantiation for the tanks selected for calculation regarding:

geometrical features and shapes of the tanks;

arrangement of tanks over the full breadth and length of the ship relative to the centre of gravity;



.3 methodology shall contain the ship's rolling calculations. As a result of the calculation, the characteristics of oscillating movements shall be obtained for all types of rolling at irregular seas applicable to all selected operating conditions (Response amplitude operators or implementation on a time scale).

During the rolling calculation, the methods may be applied based on the three-dimensional potential theory and other pitching and rolling calculation methods agreed with the Register;

.4 methodology shall contain the results of model sloshing tests in design cargo tanks.

The model test programme shall comply with the following minimum requirements:

- all the main assumptions shall be specified when used during model tests;

- description of the used test bench and equipment used for measuring and processing the measurement results shall be given;

- substantiation for the value of load scaling factor shall be given;

- the ship's oscillating movement at irregular seas shall be modelled (ship's motion characteristics can be scaled in the model test based on the Froude similarity criterion);

- duration of each model test and scope of parameters characterizing each test shall be substantiated;

.5 methodology shall include description of statistical analysis of model test results.

The statistical method description shall be given when used for short-term as well as long-term distribution of sloshing loads required to determine the maximum design loads on the walls of a cargo tank;

.6 when determining the maximum design loads, the results of model tests performed for sister ships with similar main dimensions and geometrical features of cargo tanks may be used. Feasible use of the results of earlier tests shall be justified considering the review of the compliance degree of, at least, the following characteristics:

- the selected initial technical data;

- the selected design cargo tanks;

- the rolling and pitching calculation results;

- the main assumptions used during model tests.”.