INTERNATIONAL MARITIME ORGANIZATION

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MSC.1/Circ.1536
6 June 2016

UNIFIED INTERPRETATIONS OF SOLAS REGULATIONS II-1/29.3 AND II-1/29.4

1   The Maritime Safety Committee, at its ninety-sixth session (11 to 20 May 2016), with a view to providing more specific guidance on the application of the provisions of SOLAS regulations II-1/29.3 and 29.4 concerning the steering gear test, approved the unified interpretations of SOLAS regulations II-1/29.3 and II-1/29.4, prepared by the Sub-Committee on Ship Design and Construction, at its third session (18 to 22 January 2016), as set out in the annex.

2   Member States are invited to apply the annexed unified interpretations from 13 May 2016 when applying the relevant provisions of SOLAS regulations II-1/29.3 and II-1/29.4 and to bring them to the attention of all parties concerned.

3   This circular supersedes MSC.1/Circ.1425.

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ANNEX

UNIFIED INTERPRETATIONS OF SOLAS REGULATIONS II-1/29.3 AND II-1/29.4

Regulation II-1/29 – Steering gear

1   In order for ships to comply with the performance requirements stated in regulations II-1/29.3.2 and 29.4.2, they are to have steering gear capable of meeting these performance requirements when at their deepest seagoing draught.

2   In order to demonstrate this ability, the trials may be conducted in accordance with section 6.1.5.1 of the standard ISO 19019:2005 (Sea-going vessels and marine technology – Instructions for planning, carrying out and reporting sea trials).

3   On all occasions when trials are conducted with the vessel not at the deepest seagoing draught, the loading condition can be accepted on the conditions that either:

.1   The rudder is fully submerged (at zero speed waterline) and the vessel is in an acceptable trim condition.

.2   The rudder torque at the trial loading condition has been reliably predicted (based on the system pressure measurement) and extrapolated to the maximum seagoing draught condition using the following method to predict the equivalent torque and actuator pressure at the deepest seagoing draught:

$$Q_F = Q_T \alpha$$
$$\alpha = 1.25(\frac{A_F}{A_T})(\frac{V_F}{V_T})^2$$

where:

α is the Extrapolation factor.

Q_F is the rudder stock moment (torque in the rudder stock) for the deepest service draught and maximum service speed condition.

Q_T is the rudder stock moment (torque in the rudder stock) for the trial condition.

A_F is the total immersed projected area of the movable part of the rudder in the deepest seagoing condition.

A_T is the total immersed projected area of the movable part of the rudder in the trial condition.

V_F is the contractual design speed of the vessel corresponding to the maximum continuous revolutions of the main engine at the deepest seagoing draught.

V_T is the measured speed of the vessel (considering current) in the trial condition.

Where the rudder actuator system pressure is shown to have a linear relationship to the rudder stock torque the above equation can be taken as:

$$P_F = P_T \alpha$$

where:

P_F is the estimated steering actuator hydraulic pressure in the deepest seagoing draught condition.

P_T is the maximum measured actuator hydraulic pressure in the trial condition.

Where constant volume fixed displacement pumps are utilized then the regulations can be deemed satisfied if the estimated steering actuator hydraulic pressure at the deepest draught is less than the specified maximum working pressure of the rudder actuator. Where a variable delivery pump is utilized pump data should be supplied and interpreted to estimate the delivered flow rate corresponds to the deepest seagoing draught in order to calculate the steering time and allow it to be compared to the required time.

Where A_T is greater than $0.95A_F$ there is no need for extrapolation methods to be applied.

.3   Alternatively, the designer or builder may use computational fluid dynamic (CFD) studies or experimental investigations to predict the rudder stock moment at the full seagoing draught condition and service speed. These calculations or experimental investigations should be to the satisfaction of the Administration.

4   In any case for the main steering gear trial, the speed of the ship corresponding to the number of maximum continuous revolution of main engine and maximum design pitch applies.

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