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UNIFIED INTERPRETATIONS OF SOLAS REGULATIONS II-1/28, II-1/29 AND II-1/30

1 The Maritime Safety Committee, at its ninetieth session (16 to 25 May 2012), with a view to ensuring a uniform approach towards the application of the provisions of SOLAS regulations II-1/28 and II-1/29, and following a recommendation made by the Sub-Committee on Ship Design and Equipment at its fifty-fifth session, approved unified interpretations concerning the arrangements for steering capability and function on ships fitted with propulsion and steering systems other than traditional arrangements for a ship's directional control, as contained in *Unified interpretation of SOLAS regulations II-1/28 and II-1/29* (MSC.1/Circ.1416).

2 Noting that the 1974 SOLAS Convention adequately addresses steering gear arrangements having a traditional propulsion system and a rudder-type steering system, whereas it does not adequately provide for modern combined propulsion/steering systems such as azimuth thrusters, podded propulsors, waterjets, cycloidal propellers*, etc. and that there is a need to clarify that the requirements of SOLAS regulation II-1/30.2 apply to each steering system in ships fitted with multiple steering systems, the Maritime Safety Committee, at its 101st session (5 to 14 June 2019), approved the *Unified interpretation of SOLAS regulations II-1/28, II-1/29 and II-1/30*, prepared by the Sub-Committee on Ship Systems and Equipment, at its sixth session, as set out in the annex.

3 Member Governments are invited to use the annexed interpretations from 1 January 2020 when applying the relevant provisions of SOLAS regulations II-1/28, II-1/29 and II-1/30, and to bring them to the attention of all parties concerned.

4 This circular supersedes MSC.1/Circ.1416.

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* This should not be considered as an exhaustive list.

ANNEX

UNIFIED INTERPRETATIONS CONCERNING THE ARRANGEMENTS FOR STEERING CAPABILITY AND FUNCTION ON SHIPS FITTED WITH PROPULSION AND STEERING SYSTEMS OTHER THAN TRADITIONAL ARRANGEMENTS FOR A SHIP'S DIRECTIONAL CONTROL

Introduction

The SOLAS requirements for steering gears have been established for ships having a traditional propulsion system and one rudder. For ships fitted with alternative propulsion and steering arrangements, such as but not limited to, azimuthing propulsors or water jet propulsion systems, SOLAS regulations II-1/28.2, 28.3, 29.1, 29.2.1, 29.3, 29.4, 29.6.1, 29.14 and 30.2 should be interpreted as follows, except 29.14, which is limited to the steering systems having a certain steering capability due to ship speed also in case propulsion power has failed.

Regulation 28 – Means of going astern

Paragraph 3

The stopping times, ship headings and distances recorded on trials, together with the results of trials to determine the ability of ships having multiple propulsion/steering arrangements to navigate and manoeuvre with one or more of these devices inoperative, should be available on board for the use of the master or designated personnel.

Regulation 29 – Steering gear

Paragraph 1

For a ship fitted with multiple steering-propulsion units, such as, but not limited to, azimuthing propulsors or water jet propulsion systems, each of the steering-propulsion units should be provided with a main steering gear and an auxiliary steering gear or with two or more identical steering actuating systems in compliance with interpretation of SOLAS regulation II-1/29.6.1. The main steering gear and the auxiliary steering gear should be so arranged that the failure of one of them will not render the other one inoperative.

For a ship fitted with a single steering-propulsion unit, the requirement in SOLAS regulation II-1/29.1 is considered satisfied if the steering gear is provided with two or more steering actuating systems and is in compliance with interpretation of SOLAS regulation II-1/29.6.1. A detailed risk assessment should be submitted in order to demonstrate that in the case of any single failure in the steering gear, control system and power supply the ship steering is maintained.

Paragraph 2.1

All components used in steering arrangements for ship directional control should be of sound reliable construction to the satisfaction of the Administration or recognized organizations acting on its behalf. Special consideration should be given to the suitability of any essential component which is not duplicated. Any such essential component should, where appropriate, utilize anti-friction bearings such as ball bearings, roller bearings or sleeve bearings which should be permanently lubricated or provided with lubrication fittings.

Paragraph 3

The main steering arrangements for ship directional control should be:

.1 of adequate strength and capable of steering the ship at maximum ahead service speed which should be demonstrated;

.2 capable of changing direction of the steering-propulsion unit from one side to the other at declared steering angle limits at an average turning speed of not less than 2.3°/s with the ship running ahead at maximum ahead service speed;

.3 for all ships, operated by power; and

.4 so designed that they will not be damaged at maximum astern speed; this design requirement need not be proved by trials at maximum astern speed and declared steering angle limits.

Ship manoeuvrability tests, such as according to resolution MSC.137(76) on *Standards for ship manoeuvrability*, should be carried out with steering angles not exceeding the declared steering angle limits.

> ***Definition***: *Declared steering angle limits* are the operational limits in terms of maximum steering angle, or equivalent, according to manufacturers' guidelines for safe operation, also taking into account the ship's speed or propeller torque/speed or other limitation; the "declared steering angle limits" are to be declared by the directional control system manufacturer for each ship specific non-traditional steering mean; ship manoeuvrability tests, such as those in the *Standards for ship manoeuvrability* (resolution MSC.137(76)) should be carried out with steering angles not exceeding the declared steering angle limits.

Paragraph 4

The auxiliary steering arrangements for ship directional control should be:

.1 of adequate strength and capable of steering the ship at navigable speed and of being brought speedily into action in an emergency;

.2 capable of changing direction of the ship's directional control system from one side to the other at declared steering angle limits at an average turning speed, of not less than 0.5°/s; with the ship running ahead at one half of the maximum ahead service speed or 7 knots, whichever is the greater; and

.3 for all ships, operated by power where necessary to meet the requirements of SOLAS regulation II-1/29.4.2 and in any ship having power of more than 2,500 kW propulsion power per steering-propulsion unit.

Ship manoeuvrability tests, such as according to resolution MSC.137(76), should be carried out with steering angles not exceeding the declared steering angle limits.

The definition of "declared steering angle limits", set out in the interpretation of paragraph 3 above, applies.

Paragraph 6.1

For a ship fitted with a single steering-propulsion unit where the main steering gear comprises two or more identical power units and two or more identical steering actuators, an auxiliary steering gear need not be fitted provided that the steering gear:

.1 in a passenger ship, is capable of satisfying the requirements in interpretation to SOLAS regulation II-1/29.3 while any one of the power units is out of operation;

.2 in a cargo ship, is capable of satisfying the requirements in interpretation to SOLAS regulation II-1/29.3 while operating with all power units; and

.3 is arranged so that after a single failure in its piping system or in one of the power units, steering capability can be maintained or speedily regained.

For a ship fitted with multiple steering-propulsion units, where each main steering system comprises two or more identical steering actuating systems, an auxiliary steering gear need not be fitted provided that each steering gear:

.1 in a passenger ship, is capable of satisfying the requirements in interpretation to SOLAS regulation II-1/29.3 while any one of the steering gear steering actuating systems is out of operation;

.2 in a cargo ship, is capable of satisfying the requirements in interpretation to SOLAS regulation II-1/29.3 while operating with all steering gear steering actuating systems;

.3 is arranged so that after a single failure in its piping or in one of the steering actuating systems, steering capability can be maintained or speedily regained; and

.4 the above capacity requirements apply regardless whether the steering systems are arranged with common or dedicated power units.

Definition: *Steering gear power unit* – For the purposes of alternative steering arrangements, the steering gear power unit should be considered as defined in SOLAS regulation II-1/3. For electric steering gears, refer to SOLAS regulation II-1/3; electric steering motors should be considered as part of the power unit and actuator.

Paragraph 14

This interpretation is valid to steering-propulsion units having a certain proven steering capability due to ship speed also in case propulsion power has failed.

Where the propulsion power exceeds 2,500 kW per thruster unit, an alternative power supply, sufficient at least to supply the steering arrangements which complies with the requirements of SOLAS regulation II-1/29.4.2 and also its associated control system and the steering gear response indicator, should be provided automatically, within 45 s, either from the emergency source of electrical power or from an independent source of power located in the steering gear compartment. This independent source of power should be used only for this purpose. In every ship of 10,000 gross tonnage and upwards, the alternative power supply should have a capacity for at least 30 min of continuous operation and in any other ship for at least 10 min.

Regulation 30 – Additional requirements for electric and electrohydraulic steering gear

Paragraph 2

For a ship fitted with multiple steering systems, the requirements in SOLAS regulation II-1/30.2 are to be applied to each of the steering systems.