

SUB-COMMITTEE ON SHIP DESIGN AND
CONSTRUCTION
10th session
Agenda item 8

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**REVISION OF SOLAS CHAPTERS II-1 (PART C) AND V, AND RELATED INSTRUMENTS
REGARDING STEERING AND PROPULSION REQUIREMENTS, TO ADDRESS BOTH
TRADITIONAL AND NON-TRADITIONAL PROPULSION AND STEERING SYSTEMS**

Comments on document MSC 105/18/1

Submitted by IACS

SUMMARY

Executive summary: This document presents IACS' view on document MSC 105/18/1 and offers comments on the proposed amendments intended to address both rudder-type and modern combined propulsion/steering systems.

*Strategic direction,
if applicable:* 2

Output: Not available

Action to be taken: Paragraph 15

Related documents: SSE 9/14/4, SSE 9/20 (paragraphs 14.49, 14.50 and 17.9), SDC 9/7; MSC 105/18/1 and MSC 107/20 (paragraph 12.5)

Introduction

1 The Maritime Safety Committee (MSC), at its 105th session, agreed to include in its post-biennial agenda an output on "Revision of SOLAS chapters II-1 (part C) and V and related instruments regarding steering and propulsion requirements to address both traditional and non-traditional propulsion and steering systems", with two sessions needed to complete the item, assigning the SSE Sub-Committee as the coordinating organ, in association with the NCSR and SDC Sub-Committees, as and when requested by the SSE Sub-Committee.

2 Subsequently, MSC 107 endorsed the proposal by the SDC Sub-Committee to consider the development of functional requirements and expected performances of SOLAS regulations II-1/28, II-1/29 and II-1/30 under the above-mentioned output. In this regard, the Committee decided to transfer the aforementioned output, for which the SSE Sub-Committee had been initially assigned as the coordinating organ, from its post-biennial agenda to SDC 10's provisional agenda, in order to balance the workload between the two Sub-Committees and to ensure that any amendments to MSC.1/Circ.1212/Rev.1 in relation to SOLAS chapter II-1 would be prepared by the same Sub-Committee.

3 In addition, the Committee agreed with the SDC Sub-Committee to take annex 4 to document SDC 9/7 (Japan) into account when commencing the work on the above new output, as it contained draft functional requirements for steering and propulsion under SOLAS regulations II-1/28 to 30 derived from the STEERSAFE project.

4 Further, SSE 9 considered document SSE 9/14/4 (IACS) proposing amendments to MSC.1/Circ.1416/Rev.1 to address modern combined propulsion/steering systems adequately and agreed to consider the proposal under the above new output for a holistic approach (by SDC Sub-Committee).

5 This document provides comments on document MSC 105/18/1, which is based on a dedicated study on the subject called "STEERSAFE Steering and Manoeuvrability Study" commissioned by EMSA (the consolidated final report on the study can be found under the following link <http://emsa.europa.eu/publications/reports/item/4398-steersafe.html>).

Discussion

6 IACS acknowledges that current SOLAS regulations adequately address steering gear arrangements having a traditional propulsion system and a rudder-type steering system. However, IACS considers that the Convention does not adequately provide for modern combined propulsion/steering systems, such as azimuth thrusters, podded propulsors, waterjets, and cycloidal propellers, etc.

7 When transferring into practice, IACS also noticed that the latest revision of the concerned interpretations in MSC.1/Circ.1416/Rev.1 led to redundancy requirements for non-traditional multiple steering systems excluding the use of steering-propulsion technologies of proven reliability and availability on ship level, when used in multiple steering-propulsion arrangements.

8 In this regard, IACS expresses its appreciation to the authors of the proposal in document MSC 105/18/1 providing the suggested amendments to SOLAS chapters II-1 (part C) and V, and related non-mandatory instruments. IACS expressed its view in document SSE 9/14/4 advising that the perspective of IACS is in line with the proposals made for the revision of SOLAS regulation II-1/29 (SSE 9/14/4, paragraph 13).

9 At the same time, IACS would like to offer the following supplementary comments on the proposal in document MSC 105/18/1:

- .1 IACS deems it necessary that the expression "directional control" needs a definition;
- .2 IACS prefers the more complete definition for "Declared steering angle limits" of MSC.1/Circ.1416/Rev.1;
- .3 although a definition for the neutral position is offered together with relevant requirements for locking any failed steering system in neutral position, the new SOLAS regulation II-1/29.6.6 apparently has the option of stopping in the current position (with the expression "or return to midship/neutral" in brackets);
- .4 in continuation to sub-item .3 above, IACS addresses the new SOLAS regulation II-1/29.6.6 in IACS unified requirement (UR) E25.3.1 for rudder type systems with a supplementary clarification for mechanical failures;

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- .5 as most of the non-traditional steering units also serve for propulsion, a failure of a component may lead to a simultaneous loss of the ability to steer and to move the ship. It appears that the expression "steering and propulsion type" appears only once in the proposed amendments to resolution MSC.137(76), while the main proposal in document MSC 105/18/1 addresses steering only. Accordingly, IACS is of the view that the proposal is not addressing the full scope needed for "a new output encompassing all types of modern propulsion and steering units";
- .6 the proposal makes the application of parts of resolutions A.601(15) and MSC.137(76) mandatory. Further, IACS notes in this regard that the expression "should" is suggested to be replaced by "shall" in resolution A.601(15). In this regard, IACS wonders whether the existing text of resolution A.601(15) should be retained as applicable to existing ships; except (as per the annex to resolution A.911(22)), if the revised standards are intended to indicate their effective date and application to new and existing ships, or both, and to new and existing installations of equipment, or both unless this is already specified in the relevant regulations of the parent convention; and
- .7 the proposal includes a new heading keeping test (proposed paragraph 4.2.12 in annex to draft revised resolution MSC.137(76)). IACS understands that the heading-keeping test assumes that an auto pilot is provided. Moreover, a justification for the test duration (30 minutes) is deemed necessary. IACS understands that the test condition should better follow the conventional time used for the speed trial in the ISO 15016:2015 standard. With regard to the criteria for heading-keeping ability (proposed paragraph 5.3.5 in annex to draft revised resolution MSC.137(76)), IACS understands that the max. 2 degrees yaw deviation is based on resolution A.822(19) for autopilots on high-speed craft. In this regard, IACS suggests the modification of the criteria based on the text of annex 3 to resolution MSC.64(67).

Proposal

10 IACS considers it useful to include in the definitions the expression *Ship's directional control* as the ability to change and keep heading and course on a ship; while in the definition of *Declared steering angle limits* a sentence clarifying that these limits shall be declared by the directional control system manufacturer, as already stated in MSC.1/Circ.1416/Rev.1.

11 In the new SOLAS regulation II-1/29.6.6, IACS suggests a clarification similar to the one in IACS UR E25.3.1 that for mechanical failures of static components such as pipes or cylinders, the system response without manual intervention is not mandatory.

12 In Figure 1, *Structure of goals and functional requirements*, propulsion and steering have been separately considered. As most of modern non-traditional steering equipment form combined steering-propulsion units, IACS suggests that for ships with a single steering-propulsion unit, a single failure in the steering system should not render the propulsion ineffective. In continuation to the above, IACS view is that functional requirements for "modern propulsion and steering units" need to provide corresponding requirements to availability/redundancy for the steering force. Apparently, the proposal in document MSC 105/18/1 does not cover the full scope and this needs to be considered by the Sub-Committee when developing a full set of functional requirements for modern propulsion and steering units.

13 Due to the suggested deletion of the existing SOLAS regulation II-1/30, the reference in SOLAS regulation II-1/45.6.1 should be revised.

14 For the heading-keeping test of the proposal for resolution MSC.137(76), the following are suggested:

- .1 the test should be only applicable to ships where the installation of an auto pilot for keeping course is mandatory;
- .2 a revision for the test duration from "30 minutes" to "10 minutes"; and
- .3 a modification for the yaw deviation criteria from "The maximum yaw deviation should not exceed 2 degrees during..." to "Yaw motion should not cause significant deviation during..."

Action requested of the Sub-Committee

15 The Sub-Committee is invited to consider the foregoing, and the proposals in paragraphs 10 to 14, and take action, as appropriate.
