INTERNATIONAL MARITIME ORGANIZATION

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UNIFIED INTERPRETATION OF PROVISIONS OF IMO SAFETY, SECURITY, ENVIRONMENT, FACILITATION, LIABILITY AND COMPENSATION-RELATED CONVENTIONS

IACS unified interpretation (UI) SC305 (new) of SOLAS regulation II-1/26.2 relating to single essential propulsion components and their reliability

Submitted by IACS

SUMMARY

Executive summary:	This document contains the new IACS UI SC305 (New), which recognizes the related decision of MSC 109 and provides unified interpretation of SOLAS regulation II-1/26.2 applicable to cargo and passenger ships to facilitate uniform consideration relating to single essential propulsion components and their reliability.
Strategic direction, if applicable:	7
Output:	7.1
Action to be taken:	Paragraph 15
Related documents:	SSE 8/15/3; SSE 10/12/9, SSE 10/INF.7, SSE 10/20 and MSC 109/WP.1/Rev.1 (paragraph 12.21)

Background

1 SOLAS regulation II-1/26.2 reads:

> "The Administration shall give special consideration to the reliability of single essential propulsion components and may require a separate source of propulsion power sufficient to give the ship a navigable speed, especially in the case of unconventional arrangements."

2 IACS submitted document SSE 8/15/3, seeking clarification on the requirements of SOLAS regulation II-1/26.2 for single essential propulsion components and their reliability, and offered a draft interpretation thereof. SSE 9 agreed to the draft interpretation for approval by MSC 107. MSC 107, noting diverging views on the subject, referred the draft interpretation back to the SSE Sub-Committee for further consideration.

3 Subsequently, the draft interpretation provided in document SSE 8/15/3 was considered again at SSE 10. The draft interpretation was supported; however, views were expressed that it should be restricted in its application only to passenger ships because of the specificities of that ship type and, in particular, the requirements for safe return to port under SOLAS regulation II-2/21. Further, it was suggested that a more holistic approach could address all propulsion designs by having a new output.

4 IACS noted the recommendations made to limit the interpretation to passenger ships and was content at that stage to proceed as suggested. However, IACS expressed the need for IACS to carefully look at the comments made and the reasons for that proposal going forward to the Committee. If, upon re-evaluation, IACS would have something else to offer, this would be brought to the Sub-Committee's attention.

5 SSE 9 agreed to the draft MSC circular on unified interpretation of SOLAS regulation II-1/26.2 applicable to passenger ships only. The unified interpretation was subsequently approved at MSC 109, with the effective date of 1 January 2026 (MSC 109/WP.1/Rev.1, paragraph 12.21).

Discussion

6 IACS notes a comment made that SOLAS lacks a definition of conventional and unconventional arrangements, as used in SOLAS regulation II-1/26.2. The vast majority of ships with electric propulsion are arranged either with two independent propulsion lines, with a single propulsion line with two independent electric motors, or with an additional azimuth thruster that will provide sufficient propulsion in case of failure of the main electric propulsion motor. As informed in document SSE 8/15/3, IACS has observed in the recent years incentives in the industry proposing the design addressed in document SSE 8/15/3 with a dual winding electric motor as the sole means of propulsion. So far, it is a marginal number of ships which have actually been designed and built with such a propulsion arrangement. The class rules for electrical components are based on the principles in part D of SOLAS chapter II-1 regarding service availability and redundancy. The design is, in general, deviating from the prescriptive rules of the classification societies and as such is considered by the class societies as an unconventional design.

7 IACS noted the concern expressed that this interpretation would have an impact on currently allowed designs and arrangements on cargo ships. However, the design and arrangement addressed in document SSE 8/15/3 is not allowed today according to the rules of several class societies. IACS is of the view that this interpretation will not have any notable impact on the industry now, considering the marginal number of such propulsion designs today. The purpose of the MSC 109 approved interpretation, is not to rule out alternative designs but rather to provide the needed criteria against which it would be possible to demonstrate that a sufficient and unified minimum safety level is ensured at an early stage for the emerging propulsion designs observed.

8 IACS notes the agreement at SSE 10 to limit the application of the interpretation to passenger ships only. SOLAS regulation II-2/21 for safe return to port provides a safety level beyond considering single failure of components. Passenger ships are required to maintain sufficient propulsion in case of fire or flooding in any one compartment. The design addressed in document SSE 8/15/3 is accordingly not allowed for a passenger ship based on the present regulations, not because of the risk of a single failure in a winding but because of the risk of fire or flooding in the one compartment where the component is located. Limiting the application of the interpretation only to passenger ships means that the interpretation has no practical utility.

9 While that is the case, the approval of the interpretation by MSC 109, albeit limiting it to passenger ships, is a declaration of IMO acceptance that the safety of such design cannot be left unvalidated.

10 The safety level based on the single failure criterion for components, and in particular for electric components whose failure is non-reparable onboard by the crew, applies to all ships. IACS is of the opinion that maintaining or restoring propulsion is essential also for cargo ships in order to ensure not only the safety of the ship and its crew, but also to avoid potential casualties affecting the public or the environment resulting from an allision, collision or grounding of a drifting cargo ship. As expressed in document SSE 8/15/3, IACS is of the opinion that, for safety reasons, unconventional designs should first be considered unreliable until enough evidence regarding their reliability becomes available, rather than being considered reliable until proven unreliable.

11 IACS notes the suggestion on the need for more up-to-date research and a more holistic approach to address all propulsion designs by having a new output. IACS will commit to contributing to and supporting initiatives for a more holistic approach addressing all propulsion designs. IACS understands that any potential proposal for a new output would result in amendments to SOLAS becoming applicable earliest in 2032 or later, depending on the start of that work and its completion. Until such a potential SOLAS amendment is in place, IACS will relate to its new unified interpretation SC305 (New) for all ships unless advised otherwise by the flag State for ships flying its flag.

12 As regards the safeguards, IACS notes the confirmation at MSC 109 that all interpretations approved by MSC 109 under agenda item 12 on the report of the SSE 10, have met the safeguards criteria;[*] this includes MSC.1/Circ.1685 on *Unified interpretation of SOLAS chapter II-1*, regarding SOLAS regulation II-1/26 concerning single essential propulsion components.

13 The text of IACS UI SC 305 is taken from MSC.1/Circ.1685 and is extended to apply to cargo ships, as well, in addition to passenger ships.

Proposal

14 IACS Unified Interpretation SC305 (New), as set out in the annex, will be applied by all IACS members, for single electric propulsion motors (both single and dual winding with a single rotor) installed on all ships contracted for construction on or after 1 January 2026, unless provided with a different written instruction by the Administration on whose behalf they are authorized to act as a recognized organization, for ships flying its flag.

Action requested of the Sub-Committee

15 The Sub-Committee is invited to note the foregoing, the proposal in paragraph 14 and in the annex, and to take action, as appropriate.

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[*] Please refer to the end of the audio starting at 3:46:45 on 4 December 2024

ANNEX

IACS UNIFIED INTERPRETATION SC305 (NEW):
SINGLE ESSENTIAL PROPULSION COMPONENTS AND THEIR RELIABILITY

SOLAS regulation II-1/26.2 states:

"The Administration shall give special consideration to the reliability of single essential propulsion components and may require a separate source of propulsion power sufficient to give the ship a navigable speed, especially in the case of unconventional arrangements."

Interpretation of "reliability of single essential propulsion components"

1 The possibility of failures in electric machines shall be considered. Sufficient propulsion capacity shall be maintained or restored within due time for the following failure modes of electric machines, as a minimum:

.1 winding insulation failures; and

.2 excitation failures.

2 Single electric propulsion motors (both single and dual winding with a single rotor) for main propulsion shall not be considered to provide the reliability required for a single essential propulsion component. A separate propulsion unit sufficient to give the ship a navigable speed should be required for such arrangements.

3 Propulsion arrangements with two independent rotors on a single shaft should be considered to provide the required reliability, provided it is possible to de-excite or de-flux each of the rotors individually and to supply independently the stators.

Note:

.1 This Unified Interpretation is to be uniformly implemented by IACS Societies on shipscontracted for construction on or after 1 January 2026.

.2 The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.