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Agenda item 10

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**UNIFIED INTERPRETATION OF PROVISIONS OF IMO SAFETY, SECURITY,
AND ENVIRONMENT-RELATED CONVENTIONS**

Proposed amendments to MSC.1/Circ.1572/Rev.1

Submitted by IACS

SUMMARY

Executive summary: This document proposes a revision of MSC.1/Circ.1572/Rev.1 regarding unified interpretations of the *Performance standards for water level detectors on bulk carriers and single hold cargo ships other than bulk carriers* (resolution MSC.188(79)) consequential to the adoption of resolution MSC.188(79)/Rev.2.

Strategic direction, if applicable: 7

Output: 7.1

Action to be taken: Paragraph 6

Related documents: SDC 8/18; SDC 9/16; MSC 105/20 and MSC 107/20

Background

1 The Maritime Safety Committee (MSC), at its 103rd session, adopted amendments to SOLAS chapter II-1 (resolution MSC.482(103)), which included requirements for water level detectors on multiple hold cargo ships other than bulk carriers and tankers, i.e. SOLAS regulation II-1/25-1, with the entry-into-force date of 1 January 2024.

2 As a consequence of the adoption of SOLAS regulation II-1/25-1, MSC 107 adopted resolution MSC.188(79)/Rev.2 on *Revised performance standards for water level detectors on ships subject to SOLAS regulations II-1/25, II-1/25-1, and XII/12*.

Discussion

3 IACS has considered the update of MSC.1/Circ.1572/Rev.1, which is, inter alia, the unified interpretations of the *Performance standards for water level detectors on bulk carriers and single hold cargo ships other than bulk carriers* (resolution MSC.188(79)), cross-referencing recent amendments in resolution MSC.188(79)/Rev.2.

4 During that review, IACS identified the need for the following changes to MSC.1/Circ.1572/Rev.1:

- .1 the headings of the annex to MSC.1/Circ.1572/Rev.1 should be amended to refer to all ships covered by the relevant SOLAS regulations;
- .2 references to resolution MSC.188(79) in interpretation 9.6 of the annex to MSC.1/Circ.1572/Rev.1 should be updated; and
- .3 interpretation 9.2 of the annex to MSC.1/Circ.1572/Rev.1 should be amended to align with resolution MSC.188(79)/Rev.2 regarding requirements for safe type equipment.

Proposal

5 IACS has prepared a draft revision of MSC.1/Circ.1572/Rev.1, contained in the annex, for consideration by the Sub-Committee.

Action requested of the Sub-Committee

6 The Sub-Committee is invited to consider the foregoing, the proposed amendments set out in the annex and to take action, as appropriate.

ANNEX

DRAFT AMENDMENTS TO MSC.1/CIRC.1572/REV.1

The following changes to MSC.1/Circ.1572/Rev.1 are proposed*:

"UNIFIED INTERPRETATIONS OF SOLAS CHAPTERS II-1 AND XII, OF THE TECHNICAL PROVISIONS FOR MEANS OF ACCESS FOR INSPECTIONS (RESOLUTION MSC.158(78)) AND OF THE PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON ~~BULK CARRIERS AND SINGLE HOLD CARGO SHIPS OTHER THAN BULK CARRIERS~~ SHIPS SUBJECT TO SOLAS REGULATIONS II-1/25, II-1/25-1 AND XII/12 (RESOLUTION MSC.188(79)/Rev.2)"

9 SOLAS REGULATION XII/12 – HOLD, BALLAST, AND DRY SPACE WATER INGRESS ALARMS

When water level detectors are installed on bulk carriers in compliance with regulation XII/12, the *Performance standards for water level detectors on ~~bulk carriers and single hold cargo ships other than bulk carriers~~ ships subject to SOLAS regulations II-1/25, II-1/25-1 and XII/12*, annexed to resolution MSC.188(79)/Rev.2 adopted on ~~3 December 2004~~ 8 June 2023, should be applied, taking into account the following interpretations to the paragraph of the Performance standards.

9.1 PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON ~~BULK CARRIERS AND SINGLE HOLD CARGO SHIPS OTHER THAN BULK CARRIERS~~ SHIPS SUBJECT TO SOLAS REGULATIONS II-1/25, II-1/25-1 AND XII/12, PARAGRAPH 3.2.3

Interpretation

Detection equipment includes the sensor and any filter and protection arrangements for the detector installed in cargo holds and other spaces as required by regulation XII/12.1.

9.2 PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON ~~BULK CARRIERS AND SINGLE HOLD CARGO SHIPS OTHER THAN BULK CARRIERS~~ SHIPS SUBJECT TO SOLAS REGULATIONS II-1/25, II-1/25-1 AND XII/12, PARAGRAPH 3.2.5

Interpretation

1 In general, the ~~construction and type testing~~ equipment in cargo area should be in accordance with publication IEC 60079: Electrical Equipment for Explosive Gas Atmospheres to a minimum requirement of EX(ia) suitable for installation in hazardous area comparable with Zone 1) as defined in IEC 60092-506, Clause 3.1. The equipment should be suitable for the explosive gas atmosphere and/or combustible dust that can be present, depending on the cargo carried.

2 The equipment should be manufactured, tested, marked and installed in accordance with IEC 60079-series or other equivalent recognized international standard.

* Tracked changes are indicated using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text

3 Where certified safe type equipment is installed, the equipment should be adequately protected against mechanical damage from the cargo so as to maintain its EX properties.

4 Where a ship is designed only for the carriage of cargoes that cannot create a combustible or explosive atmosphere then the requirement for ~~intrinsically safe circuitry~~ certified safe type equipment should not be insisted upon, provided the operational instructions included in the Manual required by 4.1 of the appendix to the annex specifically exclude the carriage of cargoes that could produce a potential explosive atmosphere. Any exclusion of cargoes identified in the annex should be consistent with the ship's Cargo Book and any Certification relating to the carriage of specifically identified cargoes.

~~25 The maximum surface temperature of equipment installed within cargo spaces should be appropriate for the combustible dusts and/or explosive gases likely to be encountered. Where the characteristics of the dust and/or gases are unknown, the maximum surface temperature of equipment should not exceed 85°C temperature class T6, gas group IIC and/or dust group IIIC, are to be used as appropriate depending on the cargo carried.~~

~~3 Where intrinsically safe equipment is installed, it should be of a certified safe type.~~

46 Where detector systems include ~~intrinsically safe circuits~~ certified safe type equipment, plans of the arrangements should be appraised/approved by individual classification societies.

9.3 PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON BULK CARRIERS AND SINGLE HOLD CARGO SHIPS OTHER THAN BULK CARRIERS SHIPS SUBJECT TO SOLAS REGULATIONS II-1/25, II-1/25-1 AND XII/12, PARAGRAPH 3.3.2

Interpretation

The pre-alarm, as primary alarm, should indicate a condition that requires prompt attention to prevent an emergency condition and the main alarm, as an emergency alarm should indicate that immediate actions must be taken to prevent danger to human life or to the ship.

9.4 PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON BULK CARRIERS AND SINGLE HOLD CARGO SHIPS OTHER THAN BULK CARRIERS SHIPS SUBJECT TO SOLAS REGULATIONS II-1/25, II-1/25-1 AND XII/12, PARAGRAPH 3.3.76

Interpretation

Fault monitoring should address faults associated with the system that include open circuit, short circuit, as well as arrangement details that would include loss of power supplies and CPU failure for computer-based alarm/monitoring system, etc.

9.5 PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON BULK CARRIERS AND SINGLE HOLD CARGO SHIPS OTHER THAN BULK CARRIERS SHIPS SUBJECT TO SOLAS REGULATIONS II-1/25, II-1/25-1 AND XII/12, PARAGRAPH 3.3.87

Interpretation

1 The electrical power supply should be from two separate sources, one should be the main source of electrical power and the other should be the emergency source, unless a continuously charged dedicated accumulator battery is fitted, having arrangement, location, and endurance equivalent to that of the emergency source (18 hours). The battery supply may be an internal battery in the water level detector system.

2 The changeover arrangement of supply from one electrical source to another need not be integrated into the water level detector system.

3 Where batteries are used for the secondary power supply, failure alarms for both power supplies should be provided.

9.6 PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON BULK CARRIERS AND SINGLE HOLD CARGO SHIPS OTHER THAN BULK CARRIERS SHIPS SUBJECT TO SOLAS REGULATIONS II-1/25, II-1/25-1 AND XII/12, PARAGRAPH 3.4.1

Interpretation

1 IACS UR E10 may be used as an equivalent test standard to IEC 60092-504.

2 The range of tests should include the following:

For alarm/monitoring panel:

- .1 functional tests in accordance with resolution MSC.188(79)/Rev.2 on the *Performance standards for water level detectors on ships ~~bulk carriers and single hold cargo ships other than bulk carriers~~ subject to SOLAS regulations II-1/25, II-1/25-1 and XII/12;*
- .2 electrical power supply failure test;
- .3 power supply variation test;
- .4 dry heat tests;
- .5 damp heat tests;
- .6 vibration test;
- .7 EMC tests;
- .8 insulation resistance test;
- .9 high-voltage test; and
- .10 static and dynamic inclinations tests, if moving parts are contained.

For IS barrier unit, if located in the wheelhouse: in addition to the certificate issued by a computer independent testing laboratory, EMC tests should also be carried out.

For water ingress detectors:

- .1 functional tests in accordance with resolution MSC.188(79)/Rev.2 on the *Performance standards for water level detectors on ships ~~bulk carriers and single hold cargo ships other than bulk carriers~~ subject to SOLAS regulations II-1/25, II-1/25-1 and XII/12;*
- .2 electrical power supply failure test;
- .3 power supply variation test;

- .4 dry heat tests;
- .5 damp heat tests;
- .6 vibration test;
- .7 enclosure class in accordance with resolution MSC.188(79)/Rev.2 on the *Performance standards for water level detectors on ships ~~bulk carriers and single hold cargo ships other than bulk carriers~~ subject to SOLAS regulations II-1/25, II-1/25-1 and XII/12;*
- .8 insulation resistance test;
- .9 high-voltage test; and
- .10 static and dynamic inclinations tests (if the detectors contain moving parts).

9.7 PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON ~~BULK CARRIERS AND SINGLE HOLD CARGO SHIPS OTHER THAN BULK CARRIERS~~ SHIPS SUBJECT TO SOLAS REGULATIONS II-1/25, II-1/25-1 AND XII/12, APPENDIX, PARAGRAPH 2.1.1

Interpretation

The test procedure should satisfy the following criteria:

- .1 The type tests should be witnessed by a classification society surveyor if the tests are not carried out by a competent independent test facility.
- .2 type tests should be carried out on a prototype or randomly selected item(s) which are representative of the manufactured item that is being type tested; and
- .3 type tests should be documented (type test reports) by the manufacturer and submitted for review by classification societies.

9.8 PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON ~~BULK CARRIERS AND SINGLE HOLD CARGO SHIPS OTHER THAN BULK CARRIERS~~ SHIPS SUBJECT TO SOLAS REGULATIONS II-1/25, II-1/25-1 AND XII/12, APPENDIX, PARAGRAPH 2.1.1.1

Interpretation

1 The submerged test period for electrical components intended to be installed in ballast tanks and cargo tanks used as ballast tanks should be not less than 20 days.

2 The submerged test period for electrical components intended to be installed in dry spaces and cargo holds not intended to be used as ballast tanks should be not less than 24 hours.

3 Where a detector and/or cable connecting device (e.g. junction box, etc.) is installed in a space adjacent to a cargo hold (e.g. lower stool, etc.) and the space is considered to be flooded under damage stability calculations, the detectors and equipment should satisfy the requirements of IP68 for a water head equal to the hold depth for a period of 20 days or 24 hours on the basis of whether or not the cargo hold is intended to be used as a ballast tank as described in the previous paragraphs.

9.9 PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON BULK CARRIERS AND SINGLE HOLD CARGO SHIPS OTHER THAN BULK CARRIES SHIPS SUBJECT TO SOLAS REGULATIONS II-1/25, II-1/25-1 AND XII/12, APPENDIX, PARAGRAPH 2.1.1.2

Interpretation

- 1 The type test required for the sensor should be in accordance with the following:
 - .1 The test container for the cargo/water mixture should be dimensioned so that its height and volume are such that the sensor and any filtration fitted can be totally submerged for the repeated functionality tests required by paragraph 2.1.1.2 and the static and dynamic inclination tests identified in the previous interpretation.
 - .2 The sensor and any filtration fitted that should be submerged and should be arranged in the container as they would be installed in accordance with the installation instructions required by paragraph 4.4.
 - .3 The pressure in the container for testing the complete detector should be not more than 0.2 bar at the sensor and any filter arrangement. The pressure may be realized by pressurization or by using a container of sufficient height.
 - .4 The cargo/water mixture should be pumped into the test container and suitable agitation of the mixture provided to keep the solids in suspension. The effect of pumping the cargo/water mixture into the container should not affect the operation of the sensor and filter arrangements.
 - .5 The cargo/water mixture should be pumped into the test container to a predetermined level that submerges the detector and the operation of the alarm observed.
 - .6 The test container should then be drained and the deactivation of the alarm condition observed.
 - .7 The test container and sensor with any filter arrangement should be allowed to dry without physical intervention.
 - .8 The test procedure should be repeated consecutively 10 times without cleaning any filter arrangement that may be fitted in accordance with the manufacturer's installation instructions (see also 2.1.1.2).
 - .9 Satisfactory alarm activation and deactivation at each of the 10 consecutive tests will demonstrate satisfactory type testing.

- 2 The cargo/water mixture used for type testing should be representative of the range of cargoes within the following groups and should include the cargo with the smallest particles expected to be found from a typical representative sample:
 - .1 iron ore particles and seawater;
 - .2 coal particles and seawater;
 - .3 grain particles and seawater; and
 - .4 aggregate (sand) particles and seawater.

The smallest and largest particle size together with the density of the dry mixture should be ascertained and recorded. The particles should be evenly distributed throughout the mixture. Type testing with representative particles will in general qualify all types of cargoes within the four groupings shown above.

The following provides guidance on the selection of particles for testing purposes:

- .1 Iron ore particles should mainly consist of small loose screenings of iron ore and not lumps of ore (dust with particle size < 0.1 mm).
- .2 Coal particles should mainly consist of small loose screenings of coal and not lumps of coal (dust with particle size < 0.1 mm).
- .3 Grain particles should mainly consist of small loose grains of free-flowing grain (grain having a size > 3 mm, such as wheat).
- .4 Aggregate particles should mainly consist of small loose grains of free-flowing sand and without lumps (dust with particle size < 0.1 mm).

9.10 PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON BULK CARRIERS AND SINGLE HOLD CARGO SHIPS OTHER THAN BULK CARRIERS SHIPS SUBJECT TO SOLAS REGULATIONS II-1/25, II-1/25-1 AND XII/12, APPENDIX, PARAGRAPH 3.1.1

Interpretation

The test procedure should satisfy the following criteria:

- .1 type tests should be witnessed by a classification society surveyor if the tests are not carried out by a competent independent test facility;
- .2 type tests should be carried out on a prototype or randomly selected item(s) which are representative of the manufactured item that is being type tested; and
- .3 type tests should be documented (type test reports) by the manufacturer and submitted for review by classification societies.

9.11 PERFORMANCE STANDARDS FOR WATER LEVEL DETECTORS ON BULK CARRIERS AND SINGLE HOLD CARGO SHIPS OTHER THAN BULK CARRIERS SHIPS SUBJECT TO SOLAS REGULATIONS II-1/25, II-1/25-1 AND XII/12, APPENDIX, SECTION 4 – MANUALS

Interpretation

For each ship, a copy of the manual should be made available to the surveyor at least 24 hours prior to survey of the water-level detection installation. Each classification society should ensure that any plans required for classification purposes have been appraised/approved as appropriate.