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GUIDANCE FOR NAVIGATION AND COMMUNICATION EQUIPMENT INTENDED FOR USE ON SHIPS OPERATING IN POLAR WATERS

1 The Maritime Safety Committee, at its 101st session (5 to 14 June 2019), approved the *Guidance for navigation and communication equipment intended for use on ships operating in polar waters*, as set out in the annex, prepared by the Sub-Committee on Navigation, Communications and Search and Rescue (NCSR), at its sixth session (16 to 25 January 2019).

2 The Maritime Safety Committee, at its ninety-seventh session (21 to 25 November 2016) had instructed the NCSR Sub-Committee to consider the current navigation and communication requirements in the SOLAS Convention and the need for any amendments, taking into account the extended duration requirements in the International Code for Ships Operating in Polar Waters (Polar Code).

3 The aim of this Guidance is to enhance the safety and efficiency of navigation and communication equipment intended for use on ships operating in polar waters by giving recommendations on general requirements and specific performance standards for navigation and communication equipment.

4 Member States and international organizations are invited to bring the Guidance to the attention of all parties concerned.

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ANNEX

GUIDANCE FOR NAVIGATION AND COMMUNICATION EQUIPMENT INTENDED FOR USE ON SHIPS OPERATING IN POLAR WATERS

Purpose

1 The purpose of this Guidance is to enhance the safety and efficiency of navigation and communication equipment intended for use on ships operating in polar waters:

.1 It gives recommendations on general requirements and specific performance standards for navigation and communication equipment intended for use on ships operating in polar waters.

.2 It covers:

.1 generally, all navigation and communication equipment where equipment or parts of it are exposed to the specific environmental conditions of the polar waters; and

.2 specific requirements for equipment which may be influenced by regional effects.

.3 It aims to establish requirements to facilitate different approaches (e.g. built-in protection, handling requirements, etc.).

Scope

2 This Guidance provides recommendations on:

.1 requirements for navigation and communication equipment intended for use on ships operating in polar waters, where technical provisions could reduce the listed effects;

.2 rules to operate navigation and communication equipment intended for use on ships operating in polar waters, if technical provisions could not protect the equipment from the listed effects; and

.3 additional requirements for navigation and communication equipment intended for use on ships operating in polar waters, if the equipment is influenced by incorrect data of impaired equipment only.

Structure

3 This Guidance has a modular structure:

.1 It starts with a general part (Module A) which should be applied to equipment or parts of it exposed to the environmental conditions of polar waters.

.2 The second module (Module B) is addressing equipment specific topics.

.3 The third module (Module C) is addressing the handling of incorrect data of impaired equipment.

.4 The appendix provides information on survival craft and rescue boat communications capabilities.

Application

4 This Guidance is applicable to navigation and communication equipment intended for use on ships operating in polar waters.

Abbreviations

AIS - Automatic Identification System
DSC - Digital Selective Calling
ECDIS - Electronic Chart Display and Information System
EGC - Enhanced Group Call
ENC - Electronic Navigational Chart
GNSS - Global Navigation Satellite System
HF - High Frequency
LRIT - Long Range Identification and Tracking
MF - Medium Frequency
PST - Polar Service Temperature (defined by Polar Code, part I-A, paragraph 1.2.11)
PWOM - Polar Water Operational Manual
SART - Search and Rescue Radar Transponder
SOLAS - International Convention for the Safety of Life at Sea
THD - Transmitting Heading Device
VDR - Voyage Data Recorder
VHF - Very High Frequency

MODULE A – GENERAL PART RELATED TO EQUIPMENT EXPOSED TO THE SPECIFIC ENVIRONMENTAL CONDITIONS OF POLAR WATERS

Generally, limitations due to environmental conditions should be documented in the Polar Water Operational Manual (PWOM).

A.1 Temperature

A.1.1 If equipment or parts thereof are exposed to the environmental conditions of polar waters, the navigation and communication equipment should keep its specific performance requirements as far as possible.

A.1.2 Exposed portable equipment should be subject to testing in accordance with a recognized procedure,* except that the temperature of the chamber should be reduced to, and maintained at, the specified PST.

A.1.3 In addition, test condition provisions in paragraphs not related to exposure temperature should follow the *General requirements for shipborne radio equipment forming part of the Global Maritime Distress and Safety System (GMDSS) and for electronic navigational aids* (resolution A.694(17)).

* Refer to low temperature test procedure in paragraph 8.4 of IEC 60945.

A.2 Ice accretion

A.2.1 If equipment or parts thereof are exposed to ice accretion, dependent on the polar water and season, the navigation and communication equipment should keep its specific performance requirements, as far as possible.

A.2.2 According to the Polar Code, part I-A, paragraph 4.3.1.1.1, the icing allowance as stability criterion is 30 kg/m² (around 30 mm) on horizontal parts or 7.5 kg/m² (around 7.5 mm) on vertical parts and should be used as maximum criterion for icing for the ship and related navigation and communication equipment exposed to icing with respect to its design and placement on board.

A.2.3 The performance could be ensured by:

.1 physical protection (e.g. heating);

.2 operational protection (e.g. removing); or

.3 design (e.g. location can be easily accessed for removing of ice or the design reduces possible covering of ice).

A.2.4 Where facilities to de-ice equipment are provided, these should result in the performance criteria being met within two hours from power on.

A.2.5 According to the Polar Code, the physical and operational measures should be part of the PWOM.

A.3 Handling of equipment dependent on batteries

A.3.1 According to the Polar Code, part I-A, paragraph 1.2.7, the maximum expected time of rescue means the time adopted for the design of equipment and system that provide survival support. It should never be less than five days (120 h). This requirement may be difficult to meet by some specific equipment requirements, design requirements or handling requirements.

A.3.2 Based on the interpretation provided in the appendix, the performance of equipment and systems that provide survival support may be maintained throughout the maximum expected time of rescue using design requirements, operational requirements and any other means documented in the PWOM or a combination of these.

A.3.3 Any procedures or measures taken to address ice accretion or the handling of equipment dependent on batteries, as outlined in sections A.2 and A.3 respectively, should be included in the PWOM.

MODULE B – REQUIREMENTS FOR SPECIFIC EQUIPMENT

B.1 Magnetic compass

B.1.1 If the magnetic compass is intended for use in polar waters, the performance in latitudes beyond 70 should be additionally validated with the requirements of resolution A.382(X) on *Magnetic Compasses – Carriage and performance standards*.

B.1.2 The magnetic compass fitted on deck without tarpaulin should be protected against ice accretion as described in section A.2, if it is intended for use in specified latitudes during the relevant trip within polar waters.

B.2 Pelorus, compass bearing device or heading repeater (gyro, magnetic or GNSS-THD compass)

If the related compass device is intended for use in polar waters and exposed to the weather, the pelorus or compass bearing device including their means of correction should be protected against ice accretion as described in section A.2.

B.3 ECDIS

The ECDIS should be capable of displaying ENCs in a projection suitable for higher latitudes, as applicable, for the intended route. Input data of critical input sensors should be handled as described in module C.

B.4 GNSS-receiver

The GNSS-antenna should be protected against ice accretion as described in section A.2.

B.5 Radar reflector

The radar reflector should be protected against ice accretion as described in section A.2.

B.6 Sound reception system

The outdoor microphones of the sound reception system should be protected against ice accretion as described in section A.2.

B.7 Daylight signalling lamp (if fitted on deck)

The daylight signalling lamp (if fitted on deck) should be protected against ice accretion as described in section A.2.

B.8 Radar

The radar antenna should be protected against ice accretion as described in section A.2. Input data of critical input sensors should be handled as described in module C.

B.9 Speed and distance measuring equipment

If underwater sensors are used for measuring speed through water, the performance in very clean water conditions with a significant reduced number of particles in the water, as expected in polar waters, should be validated to be within the requirements of the *Performance standards for devices to indicate speed and distance* (resolution A.824(19)).

B.10 GNSS-THD

The GNSS-THD antenna should be protected against ice accretion as described in section A.2. The performance in latitudes beyond 70° should be additionally validated to be within the requirements of the *Performance standards for marine transmitting heading devices (THDs)* (resolution MSC.116(73)).

B.11 AIS

The AIS antennas should be protected against ice accretion as described in section A.2. Input data of critical input sensors should be handled as described in module C.

B.12 Gyro compass

If the gyro compass is intended for use in polar waters, the performance in latitudes beyond 70° should be additionally validated to be within the requirements of the *Performance standards for gyro compasses* (resolution A.424(XI)).

B.13 Heading or track control system

Input data of critical input sensors should be handled as described in module C.

B.14 LRIT

The function may be limited depending on latitude and selected system (Inmarsat C is limited whereas Iridium may offer a full coverage). The LRIT antennas should be protected against ice accretion as described in section A.2.

B.15 VDR (if fitted on deck)

The float-free release mechanism of the VDR fitted on deck should be protected against ice accretion as described in section A.2.

B.16 Navigation bridge visibility

The navigation bridge windows should be protected against ice accretion as described in section A.2.

B.17 Pilot ladder

The pilot ladder should be protected against ice accretion as described in section A.2.

B.18 Antennas for all radiocommunication equipment

The antennas for radiocommunication equipment should be protected against ice accretion as described in section A.2.

B.19 EGC receiver

The function may be limited, in the case of Inmarsat EGC, depending on latitude. The EGC receiver antennas should be protected against ice accretion as described in section A.2.

B.20 EPIRB

The EPIRB should be protected against ice accretion as described in section A.2.

B.21 Two-way VHF radiophones for use in survival crafts

Two-way VHF radiophones for use in survival crafts should be included in the PWOM.

B.22 Navigation lights/360° Search light

The navigation and search lights should be protected against ice accretion as described in section A.2.

B.23 Sound signalling equipment

The sound signalling equipment should be protected against ice accretion as described in section A.2.

B.24 Search and rescue locating device (SART/AIS-SART)

The SART **/** AIS-SART should be protected against ice accretion as described in section A.2.

MODULE C – HANDLING OF INCORRECT DATA

Depending on the region (latitude) some sensors (e.g. heading, speed) may not work with the accuracy defined in the relevant standards. There should be an automatic warning or a clear indication that the bridge crew is able to decide to use the information for display or for use in any other calculation of connected equipment.

APPENDIX

SURVIVAL CRAFT AND RESCUE BOAT COMMUNICATIONS CAPABILITIES

1 All rescue boats, all lifeboats and all other survival craft carried by the ship, notwithstanding the redundancy in aggregate capacity of survival craft required by SOLAS regulations III/21 and III/31, and taking into account the different possible distress scenarios, are considered able to be released for evacuation simultaneously and should be provided with mandatory communication equipment accordingly.

2 The expressions "shall maintain capability for", "shall be capable of operation during the maximum expected time of rescue" and "are available for operation during the maximum expected time of rescue" used in paragraphs 10.2.2.1, 10.2.2.2, 10.2.2.3 and 10.3.2.3 of part I-A of the Polar Code mean the ability of mandatory communication equipment for use in survival craft, including liferafts, and rescue boats to maintain the ready for operation state within the maximum expected time of rescue at the Polar Service Temperature (PST) assigned to the ship, and, after that, to be capable to perform its functions at the PST assigned to the ship for the operating time not less than that specified in respective existing performance standards.*

> **Note:** For example, it is not required that an EPIRB used for distress alerting continues distress messaging for the maximum expected time of rescue and the two-way VHF radiotelephone apparatus being used for transmitting and receiving on-scene communications does not need to be technically in operation at its highest rated power with a duty cycle of 1:9 for maximum expected time of rescue.

3 Procedures referred to in paragraph 10.3.2.3 of part I-A of the Polar Code can include both operational requirements and any other means, including technical solutions, i.e. thermal insulation, chemical heat sources, additional batteries, rechargeable batteries with respective chargers, etc., and should be documented in the PWOM.

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* Refer to the following performance standards: EPIRB - resolutions A.810(19) and MSC.471(101); Radar transponder - resolution A.802(19); AIS-SART - resolution MSC.246(83); Two-way VHF radiotelephone apparatus - resolution MSC.149(77).