

11TH MEETING OF THE HYDROGRAPHIC SERVICES AND STANDARDS COMMITTEE
CAPE TOWN, SOUTH AFRICA, 6-9 MAY 2019

Paper for Consideration by HSSC
IMO activities affecting HSSC (including e-navigation)

Submitted by:	IHO Secretariat
Executive Summary:	This document provides some outcomes from the 99 th and 100 th sessions of the Maritime Safety Committee and the 6 th session of the Navigation, Communications, and Search and Rescue Sub-Committee. For more detailed information, refer to related documents below.
Related documents:	IHO CL 34/2018 dated 11 June 2018, IHO Bulletin reports December 2018, IHO CL 13/2019 dated 4 March 2019
Related Projects:	HSSC Work Programme Maintenance of IHO Publications and Services related to ENC ECDIS and MSI Development of the S-100 framework.

99th session of the Maritime Safety Committee (MSC 99)

1. Maritime Autonomous Surface Ships

1.1 The MSC 99 commenced work to examine how safe, secure and environmentally sound Maritime Autonomous Surface Ships (MASS) operations may be addressed in IMO instruments. The Committee endorsed a framework for a regulatory scoping exercise, including preliminary definitions of MASS and degrees of autonomy, as well as a methodology for conducting the exercise and a plan of work.

2. Adoption of amendments

2.1 The MSC adopted amendments to the following relevant instrument:

Chapter IV of SOLAS, and the appendix to the annex to the 1974 SOLAS Convention.

2.2 The amendments to chapter IV of SOLAS, and the appendix to the annex to the 1974 SOLAS Convention, replaced all references to “Inmarsat” with references to a “recognized mobile satellite service” and consequential amendments were agreed to the International Code of Safety for High speed Craft, 1994 (1994 HSC Code), the International Code of Safety for High-speed Craft, 2000 (2000 HSC Code) and the Code of Safety for Special Purpose Ships, 2008 (2008 SPS Code). These amendments are expected to enter into force on 1 January 2020.

3. Polar Code – second phase

3.1 The International Code for Ships Operating in Polar Waters (Polar Code) entered into force in January 2017 under both the SOLAS and MARPOL treaties. It provides additional requirements for

ships trading in Arctic waters and the Antarctic area, on top of applicable SOLAS and MARPOL regulations.

3.2 The MSC considered how the safety measures of the Polar Code might be applied in the future to non-SOLAS vessels operating in polar waters and agreed that the development of such safety measures should focus on fishing vessels, pleasure yachts above 300 gross tonnage not engaged in trade and cargo ships below 500 gross tonnage down to 300 gross tonnage.

3.3 The Committee agreed to establish a working group at MSC 100 to further consider how to move forward with developing mandatory and/or recommendatory measures for ships operating in polar waters but not currently covered by the Polar Code; and the involvement of the Sub-Committee on Navigation, Communications and Search and Rescue (NCSR) concerning communication and navigation requirements for such vessels.

3.4 Member States and interested international organizations were invited to submit proposals to the next session.

4. Adoption/approval of guidance and guidelines

4.1 The MSC 99 also:

Adopted Performance standards for shipborne Indian Regional Navigation Satellite System (IRNSS) receiver equipment;

Approved the updated IMO e-navigation Strategy Implementation Plan (SIP);

Approved Interim guidelines for the harmonized display of navigation information received via communications equipment;

Adopted amendments to the Revised Performance standards for integrated navigation systems (INS) (resolution MSC.252(83)) relating to the harmonization of bridge design and display of information; and

100th session of the Maritime Safety Committee (MSC 100)

5. The Maritime Safety Committee (MSC) completed its landmark 100th session, with progress in the regulatory scoping exercise in particular on maritime autonomous surface ships and polar shipping.

6. A special session brought in invited speakers who discussed future technologies and the continued role of the seafarer. A new IMO safety video was launched, highlighting the wide spectrum of work the Committee has done over six decades to enhance safety and security at sea, including navigation, cargoes, ship construction, seafarer training, search and rescue and communications and more.

7. Regulatory scoping exercise on Maritime Autonomous Surface Ships

7.1 The process of assessing IMO instruments for applicability to ships with varying degrees of autonomy continued during the MSC 100. Following testing of the methodology by a correspondence group, the MSC approved the framework and methodology for the regulatory scoping exercise on Maritime Autonomous Surface Ships (MASS).

7.2 For each instrument related to maritime safety and security, and for each degree of autonomy, provisions will be identified which:

apply to MASS and prevent MASS operations; or

apply to MASS and do not prevent MASS operations and require no actions; or

apply to MASS and do not prevent MASS operations but may need to be amended or clarified, and/or may contain gaps; or have no application to MASS operations.

7.3 The degrees of autonomy identified for the purpose of the scoping exercise are:

Degree 1: Ship with automated processes and decision support: Seafarers are on board to operate and control shipboard systems and functions. Some operations may be automated and at times be unsupervised but with seafarers on board ready to take control;

Degree 2: Remotely controlled ship with seafarers on board: The ship is controlled and operated from another location. Seafarers are available on board to take control and to operate the shipboard systems and functions;

Degree 3: Remotely controlled ship without seafarers on board: The ship is controlled and operated from another location. There are no seafarers on board; and

Degree 4: Fully autonomous ship: The operating system of the ship is able to make decisions and determine actions by itself.

Once the first step of the scoping exercise is completed, a second step will be conducted to analyse and determine the most appropriate way of addressing MASS operations, taking into account human element, technology and operational factors.

7.4 The list of instruments to be covered in the MSC's scoping exercise for MASS includes those covering safety (SOLAS); collision regulations (COLREG); loading and stability (Load Lines); training of seafarers and fishers (STCW, STCW-F); search and rescue (SAR); tonnage measurement (Tonnage Convention); Safe Containers (CSC); and special trade passenger ship instruments (SPACE STP, STP).

8. Development of guidelines on MASS trials

8.1 The MSC noted provisional principles for the development of guidelines on MASS trials.

The principles include ensuring that such guidelines should be generic and goal-based, and taking a precautionary approach to ensuring the safe, secure and environmentally sound operation of MASS. Interested parties were invited to submit proposals to the next session of the Committee, taking into account these principles.

9. Safety of ships in polar waters

9.1 The Committee discussed how to move forward with developing possible mandatory and/or recommendatory measures for ships operating in polar waters which are not currently covered by the Polar Code. A roadmap was agreed, which could see revisions to SOLAS and/or the Polar Code considered for adoption in 2022.

9.2 At MSC 100, the Committee considered the wider application of Polar Code chapters 9 (Safety of navigation), 10 (Communication) and 11 (Voyage planning).

6th session of the Navigation, Communications, and Search and Rescue Sub-Committee (NCSR 6)

10. New ship routing systems

10.1 The Sub-committee agreed on a Procedure for the submission of documents containing proposals for the establishment of, or amendments to, ships' routing systems or ship reporting systems, for approval by MSC 101.

11. E-navigation further developed

11.1 The Sub-Committee continued its work on matters related to e-navigation. As shipping moves into the digital world, e-navigation is expected to provide digital information and infrastructure for the benefit of maritime safety, security and protection of the marine environment, reducing administrative burden and increasing the efficiency of maritime trade and transport. E-navigation is defined as “the harmonized collection, integration, exchange, presentation and analysis of marine information on board and ashore by electronic means to enhance berth to berth navigation and related services for safety and security at sea and protection of the marine environment”.

11.2 An updated IMO e-navigation Strategy Implementation Plan (SIP) was approved by MSC 99 in May 2018 (MSC.1/Circ.1595).

11.3 The Sub-Committee:

- Agreed a draft MSC circular on *Guidelines for the standardization of user interface design for navigation equipment*. The aim is to promote improved standardization of the user interface and information used by seafarers to monitor, manage and perform navigational tasks will enhance situation awareness and improve safety of navigation. The guidelines, including icons, apply to Integrated Navigation Systems (INS), Electronic Chart Display and Information Systems (ECDIS) and Radar equipment, and they may be applied to other electronic navigation equipment where applicable, improving standardization and usability.
- Agreed draft amendments to the *Performance standards for the presentation of navigation-related information on shipborne navigational displays* (resolution MSC.191(79)), including implementation dates, for radar equipment, electronic chart display and information systems (ECDIS) and integrated navigation systems (INS). The implementation date of the revised standard should be 1 January 2024; and for all other navigational displays on the bridge of a ship 1 July 2025.
- Finalized the draft SN.1/Circ.243/Rev.2 to update the *Guidelines for the presentation of navigational-related symbols, terms and abbreviations*, which provide guidance on the appropriate use of navigation-related symbols to achieve a harmonized and consistent presentation.
- Agreed a draft MSC resolution on *Guidance on the definition and harmonization of the format and structure of Maritime Services in the context of e navigation*. The purpose of the guidance is to ensure that Maritime Services are implemented internationally in a standardized and harmonized format. All Maritime Services should be conformant with the International Hydrographic Organization (IHO) S-100 framework standard, which specifies the method for data modelling and developing product specifications.
- Agreed a draft MSC circular on *Initial descriptions of maritime services in the context of e-navigation*. The circular includes what is intended to be the first draft of Maritime Service descriptions and is an initial contribution for the harmonization of their format and structure.

11.4 The Initial descriptions are expected to be periodically updated, taking into account developments and related work on harmonization.

11.5 Following a request by a number of delegations for a more active participation of IMO in the process of harmonization of maritime services, exercising its leading role, the

Sub-Committee agreed that IMO should work in collaboration with Member States, and in partnership with other international organizations, in the further development and harmonization work related to the definition and structure of maritime services in the context of e-navigation (including vessel traffic services (VTS) information service, maritime safety information (MSI) services, vessel shore reporting, ice navigation, search and rescue, pilotage and tug services, telemedical assistance, meteorological and hydrographic information, etc.).

12. Modernizing the GMDSS

12.1 The Sub-Committee continued ongoing work to modernize the Global Maritime Distress and Safety System (GMDSS). The mandatory GMDSS was adopted in 1988 to ensure full integration of maritime radio and satellite communications so that distress alerts can be generated from anywhere on the world's oceans. The modernization plan aims to update the provisions, including allowing for the incorporation of new satellite communication services.

12.2 The aim is to develop a set of draft amendments to chapters III and IV of the International Convention for the Safety of Life at Sea (SOLAS), for adoption in 2022 with entry into force in 2024. There will also be consequential amendments to other instruments, such as guidance and performance standards.

12.3 The Sub-Committee agreed, in principle, to draft amendments to SOLAS chapters III and IV, and continued its work on consequential amendments to other instruments. A correspondence group was established to continue the work intersessionally.

Maritime Safety Information (MSI) and Maritime Services

13. Documentation

13.1 Maritime Safety Information (MSI) includes navigational and meteorological warnings, meteorological forecasts and other urgent safety-related messages broadcast to ships. Amendments to SOLAS adopted in 2018 (entering into force on 1 January 2020) provide for new mobile satellite services recognized by the International Maritime Organization (IMO) to be used in the Global Maritime Distress and Safety System (GMDSS), and allow the broadcast of MSI to a defined geographical area through those newly recognized services, in addition to the existing Inmarsat services.

13.2 In this context, the NCSR 6 approved draft amendments to the following MSI-related instruments to accommodate these developments, to be effective from 1 January 2020:

International SafetyNET Manual (MSC.1/Circ.1364/Rev.1);
Promulgation of maritime safety information (resolution A.705(17), as amended);
World-Wide Navigational Warning Service (resolution A.706(17), as amended); and
IMO/WMO Worldwide Met-Ocean Information and Warning Service guidance document (resolution A.1051(27)).

13.3 The NCSR 6 also finalized *Interim guidance on technical requirements for Fleet Safety enhanced group call receivers for SOLAS compliant mobile earth stations*, pending future inclusion in the International SafetyNET Manual.

14. Inmarsat

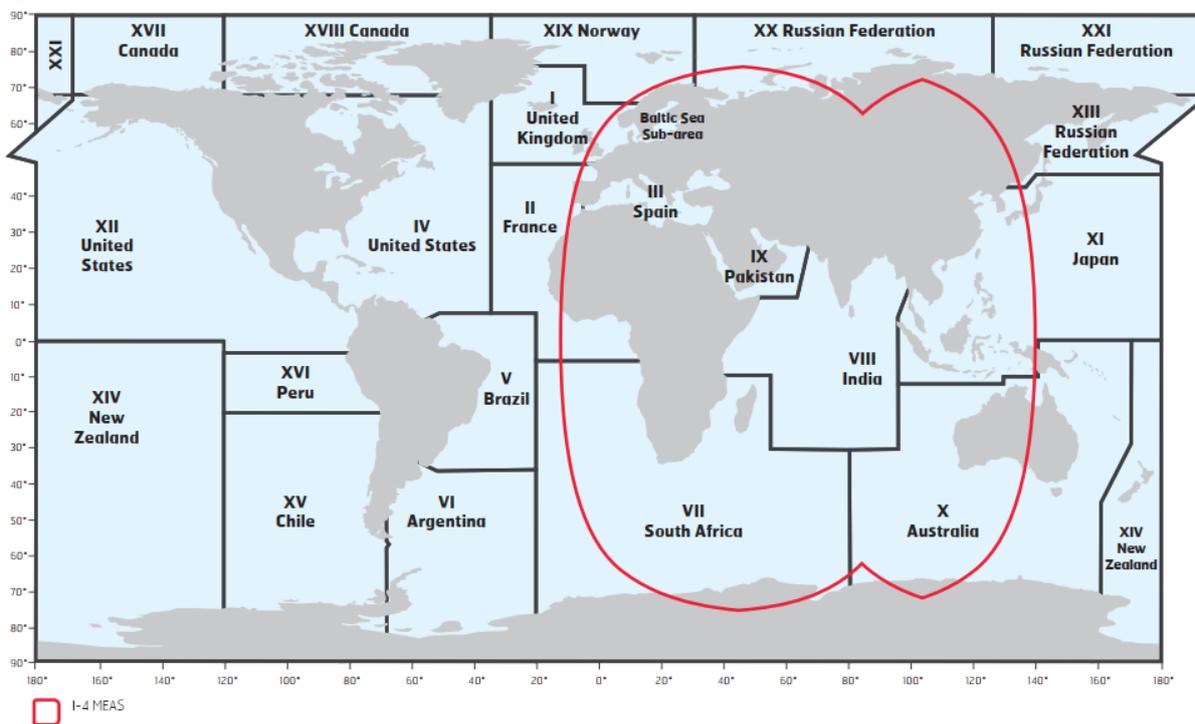
14.1 Inmarsat stated operational coverage is 76°N - 76°S via three geo-stationary I4 satellites, although up to 78°N has been achieved.

14.2 SafetyNET Services have two systems which are now available and in use by all information providers (NAV and MET Area Coordinators and RCCs):

SafetyNET – SafetyNET messages are submitted by registered information providers for promulgation to the appropriate satellite Ocean Region(s) via an Inmarsat C Land Earth Station (LES) through the I4 satellites to vessels at sea; and

SafetyNET II – provides an interactive web portal for MSI providers to promulgate their MSI messages over the Inmarsat EGC system direct to I4 satellites via web interface. SafetyNET II messages are submitted by registered information providers via a secure interface to the Inmarsat network.

14.3 Fleet Safety – MSC 99 adopted resolution MSC.450(99) on *Statement of Recognition of Maritime Satellite Services provided by Inmarsat Global Ltd.* The Committee noted that the Inmarsat Fleet Safety service was at present a regional service covering the Indian Ocean region, it is anticipated that it will become a global service in late 2019.



Fleet Safety GMDSS approved area until Inmarsat 6 satellite constellation deployed

14.4 Fleet Safety is the digital satellite communications system comprising of a FleetBroadband Ship Earth System, (SES) and type approved Maritime Safety Terminal (MST) for use within the GMDSS, enabling ships to meet the majority of the satellite communications requirements of the GMDSS including distress alerting, reception of MSI and SAR related information, voice distress and general communications.

15. Iridium

15.1 Iridium provides global coverage through a constellation of low orbiting satellites. The constellation is nearly completed with spare satellites.

- 15.2 MCS 99 adopted resolution MSC.451(99) on *Statement of Recognition of the Maritime Mobile Satellite Services provided by Iridium Satellite LLC*, which recognized the maritime mobile satellite services provided by the Iridium Safety Voice, Short-Burst Data and enhanced group calling services, for use in GMDSS.
- 15.3 The system service manual was comprehensively reviewed at Document Review Work Group immediately after NCSR 6. Draft interim preliminary text was agreed and will be presented to MSC 101 for wider publication to allow Initial Operational Certificates (IOC) to be issued to selected NAV and MET Area Coordinators and RCCs, which will enable operational testing of the system and services. It is proposed that an expanding number of certificates will be issues throughout 2019 so that Full Operational Certificates (FOC) can be issued around the end of 2019.
- 15.4 The necessary SOLAS amendments are planned to come into force on 1 January 2020, after which Iridium can commence full operational service on receipt of the IMSO Letter of Compliance and the signing of the Public Service Agreement.
- 15.5 All NAV and MET Area Coordinators and RCCs will be required to provide MSI and SAR services via all recognized mobile satellite service providers, a point which will be included in the new FOCs issued by the IMO Enhanced Group Call (EGC) Coordinating Panel (formerly the International SafetyNET Coordinating Panel).
- 15.6 Iridium have named their service the Iridium SafetyCast service.

Action Required of HSSC

The HSSC is invited to:

- a. Note this report
- b. **encourage**, in general, that Hydrographic Offices maintain liaison with their national Maritime Administrations to ensure that their views and interests are acknowledged in their country's views on, and contribution to, the progress of outputs affecting the provision of hydrographic services and maritime safety information. This is particularly relevant for those agenda items covering aspects of the GMDSS and the display of navigational information on various bridge equipment, for which IHO Member States have a direct interest and expertise;
- c. **consider**, at their NCSR and Maritime Safety Committee (MSC) pre-meeting preparations and in general engagement with their national maritime administrations, when formulating national positions on relevant agenda items, that Hydrographic Offices take into account discussions in the applicable IHO subordinate bodies to ensure a consistent approach is maintained; and
- d. **note**, the expectation that the description of Maritime Services, in the context of e-navigation, be periodically updated taking into account developments and related work on harmonization.
- e. **consider** if and how the IHO should be involved in the development of MASS concepts (for instance, supporting organization identified in the IMO MASS work plan, in particular to raise the importance of data quality factors for autonomous navigation, etc.).
- f. take action as appropriate.

