ANNEX 10

REVIEW AND MODERNIZATION OF THE GMDSS

OUTCOME OF THE HIGH LEVEL REVIEW OF THE GMDSS

Introduction

1 The Maritime Safety Committee, at its ninetieth session, approved an unplanned output on "Review and modernization of the Global Maritime Distress and Safety System (GMDSS)", with a target completion year of 2017. In accordance with the work plan, this report is the final report on the outcome of the High-level Review as approved by the Sub-Committee on Navigation, Communications and Search and Rescue (NCSR), at its first session (30 June to 4 July 2014).

2 The work plan provides for this High-level Review to be followed by a Detailed Review. The Sub-Committee on Navigation, Communication and Search and Rescue (NCSR) and its correspondence group performed the High-level Review, with the participation of the Joint IMO/ITU Experts Group on Maritime radiocommunication matters (Experts Group).

3 The High-level Review was limited to the following over-arching issues concerning the GMDSS:

.1 review of the existing nine functional requirements, including:

.1 the possible need for inclusion of security-related communications in the GMDSS; and

.2 the consideration of the possible need to develop a clearer definition of "General Communications", which is continuing to cause confusion and consider if this category should be included within the requirements of the GMDSS;

.2 the need for the current order of priorities in use for radiocommunications;

.3 the future need for the four different areas of carriage requirements (sea areas A1 to A4), and port State control procedures if sea areas are changed;

.4 the future need to allow for differences for certain categories of ships, including non-SOLAS ships;

.5 whether distress communications should be separated from other types of communications and in consequence whether the arrangements in chapters in SOLAS could be revised (Note: chapter II, (part D – Electrical installations), chapter III, (part B in several instances), chapter V in various instances including e-navigation applications).

.6 possible alignment between chapters III, IV, V and XI-2 of SOLAS, in particular, with regard to type approval, secondary equipment and maintenance arrangements and their regulatory status (i.e. mandatory or discretionary); and

.7 assess whether to increase the use of goal-based methodologies when reviewing the regulations and regulatory framework for GMDSS in SOLAS chapters IV and V and the STCW Convention, to provide flexibility to allow the GMDSS to adapt to new and evolving technologies without major revision of the SOLAS and STCW Conventions in future.

Review of the existing nine functional requirements

4 The current regulation IV/4 of SOLAS requires that every ship[1], while at sea, shall be capable:

.1 except as provided in regulations 8.1.1 and 10.1.4.3, of transmitting ship-to-shore distress alerts by at least two separate and independent means, each using a different radiocommunication service;

.2 of receiving shore-to-ship distress alerts;

.3 of transmitting and receiving ship-to-ship distress alerts;

.4 of transmitting and receiving search and rescue coordinating communications;

.5 of transmitting and receiving on-scene communications;

.6 of transmitting and, as required by regulation V/19.2.3.2, receiving signals for locating;

.7 of transmitting and receiving maritime safety information;

.8 of transmitting and receiving general radio communications to and from shore-based radio systems or networks subject to regulation 15.8; and

.9 of transmitting and receiving bridge-to-bridge communications.

Security-related communications

5 Requirements for maritime security are given in SOLAS chapter XI-2. The Ship Security Alert System (SSAS) does not involve communication with other ships or with coast radio stations. Therefore, those communications are neither ship-to-ship nor ship-to-shore communications. Communications are addressed to a designated competent authority. Therefore, security-related communications should not be a functional requirement of the GMDSS but chapter IV should include a requirement for ships to be capable of security related communications, and a definition of "security-related communications" is also required.

6 Therefore, a definition of "security-related communications" is proposed to be added to regulation IV/2, as follows:

"*Security-related communications* means communications associated with the update of security levels, security incidents or threat thereof and security-related information prior to the entry of a ship into a port."

[1] Under the general applicability requirements of the SOLAS Convention as well as regulation IV/1.1, "every ship" means cargo ships over 300 gross tonnage and passenger ships, on international voyages.

7 Security information is occasionally transmitted as Maritime Safety Information (MSI). Security-related requirements are already included in paragraph 4.2.2.17 of the Joint IMO/IHO/WMO Manual on Maritime Safety Information (MSI Manual). A revision to the definition of MSI, therefore, is not required.

General communications

8 The existing definition in SOLAS regulation IV/2.1.5, defines general radio communications as "operational and public correspondence traffic, other than distress, urgency and safety messages conducted by radio."

9 Coast radio stations (Government owned) which provided public correspondence facilities when the GMDSS was first designed have now all largely closed down. However, facilities for public correspondence are still required. These communications are now being achieved using commercial services which are not normally associated with coast radio stations and the term public correspondence is no longer widely used. For the Modernized GMDSS it is therefore proposed to change the term Public correspondence to "Other communications" and include a new capability for Other communications but not as part of the GMDSS functional requirements.

10 The definition of urgency and safety communications is given in article 33 of the Radio Regulations and now includes the following communications:

.1 navigational and meteorological warnings and urgent information;

.2 ship-to-ship safety of navigation communications;

.3 ship reporting communications;

.4 support communications for search and rescue operations;

.5 other urgency and safety messages; and

.6 communications relating to the navigation, movements and needs of ships and weather observation messages destined for an official meteorological service.

Operational communications is now, therefore, covered under the definition of urgency and safety communications.

11 It is proposed to redefine the term "General communications" by aligning it with the Radio Regulations. The new definition proposed is:

"*General communications* means operational communications, other than distress conducted by radio."

12 MSC/Circ.1038 on *Guidelines for general communications* will need to be revised or withdrawn to reflect this change.

Maritime Safety Information (MSI)

13 A further issue that was identified during the review involved Maritime Safety Information (MSI).

14 Under the existing definition in SOLAS regulation IV/2.1.9, *"Maritime safety information"* means navigational and meteorological warnings, meteorological forecasts and other urgent safety-related messages broadcast to ships. This definition is also consistent with the Radio Regulations and performed by a shore base service and there is no need to revise the current definition of MSI in SOLAS regulation IV/2. However, in order to align the SOLAS definition with the common use of the term "MSI", and as a consequence the use of this term in other documents, the need was identified to include the abbreviation "MSI" in SOLAS regulation IV/2, by the following editorial amendment: *"Maritime Safety Information (MSI)* means navigational and …..".

15 The existing functional requirement No.7 however requires that ships have a capability to transmit and receive maritime safety information. This capability results from requirements in SOLAS V for ships to transmit danger messages.

16 It is, therefore, proposed to add a new functional requirement for ships to be capable for transmitting and receiving safety-related information, whilst retaining the functional requirement for ships to receive MSI.

Proposed functional requirements for the Modernized GMDSS

17 The new text of regulation IV/4 is proposed as follows:

1 Every ship, while at sea, shall be capable of:

.1 performing the Global Maritime Distress and Safety System (GMDSS) functions as follows:

.1 transmitting ship-to-shore distress alerts by at least two separate and independent means, each using a different radiocommunication service;

.2 receiving shore-to-ship distress alert relays;

.3 transmitting and receiving ship-to-ship distress alerts;

.4 transmitting and receiving search and rescue coordinating communications;

.5 transmitting and receiving on-scene communications;

.6 transmitting and receiving signals for locating;

.7 transmitting and receiving safety-related information;

.8 receiving Maritime Safety Information (MSI);

.9 transmitting and receiving general communications; and

.10 transmitting and receiving bridge-to-bridge communications,

.2 transmitting and receiving security-related communications, in accordance with the requirements of the International Ship and Port Facility Security Code; and

.3 transmitting and receiving other communications to and from shore-based systems or networks.

Order of priorities in use for radiocommunications

18 The Radio Regulations provide the existing order of four levels of priority, as follows:

.1 Distress calls, distress messages, and distress traffic.
.2 Urgency communications.
.3 Safety communications.
.4 Other communications.

19 The four priorities are needed for communications and operational use in general, including voice, maritime safety information, as well as other text and data messages. Priorities for text and data messages can be used to sort message displays in order of importance or the way in which they are displayed. However, two priorities are sufficient for controlling the radiocommunication link, for example by using pre-emption.

20 It is concluded, therefore, that the four levels of priority should be retained, and apply to voice, text, and data messages and that there is no need to revise article 53 of the Radio Regulations. Automated systems should give priority to category 1 as required in article 53.2. Automated systems should also give priority to categories 2 and 3 (ahead of category 4), but this would not be in conflict with article 53.

Future need for the four different areas of carriage requirements

Existing definitions

21 SOLAS regulation IV/2 defines the existing sea areas:

"*Sea area A1*" means an area within the radiotelephone coverage of at least one VHF coast station in which continuous DSC alerting is available, as may be defined by a Contracting Government.

"*Sea area A2*" means an area, excluding sea area A1, within the radiotelephone coverage of at least one MF coast station in which continuous DSC alerting is available, as may be defined by a Contracting Government.

"*Sea area A3*" means an area, excluding sea areas A1 and A2, within the coverage of an INMARSAT geostationary satellite in which continuous alerting is available.

"*Sea area A4*" means an area outside sea areas A1, A2 and A3.

Sea area A1

22 During the High-level Review it was noted that extensive use was made of VHF communications and, therefore, sea area A1 should be retained.

Sea area A2

23 Equipment available for terrestrial communication on board ships is invariably combined MF/HF transceivers which are suitable for use in sea areas A2 and A3. The combination of those two areas was considered, however, it was noted that considerable use is made of MF voice communications. Furthermore, there are also different maintenance requirements for sea areas A2 and A3, and it was finally concluded that sea area A2 should be retained as a separate sea area.

Sea areas A3 and A4

24 The definition of the boundary between sea area A3 and A4 is currently defined by Inmarsat coverage, but Inmarsat might not always be the only GMDSS satellite provider. In future, the Organization might recognize regional or global satellite systems to provide GMDSS services in an A3 sea area, each of them providing coverage different to the current A3 sea area.

25 It is noted that Sea areas A3 and A4 are defined by the Organization, whereas A1, which is related to VHF coverage, and A2, which is related to MF coverage, is defined by Contracting Governments.

26 It was considered that HF should remain a requirement for sea area A4 and an option for sea area A3, excluding any special requirements which might be developed under the Polar Code.

27 It was noted that there may be difficulties to relay distress alerts when a large number of providers would offer services through different systems, as SAR authorities would not know what particular equipment is on any particular ship.

28 One way for differentiating between sea areas A3 and A4 which was considered, is that sea area A3 is related to satellite coverage and sea area A4 is related to HF.

29 References to "Inmarsat" throughout SOLAS chapter IV will need to be changed to refer to "recognized mobile satellite communication service", to be consistent with terminology in resolution A.1001(25).

Options for the definition of sea areas A3 and A4

30 Recognizing that other options for the definition of sea areas A3 and A4 could be developed, three different options for the definition of sea areas A3 and A4 (SOLAS regulation IV/2.14) were identified as follows:

OPTION 1

> "*Sea area A3*" means an area, excluding sea areas A1 and A2, within the coverage of a recognized mobile satellite communication service using geostationary satellites in which continuous alerting is available.
>
> "*Sea area A4*" means an area outside sea areas A1, A2 and A3.
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> Comments on Option 1:
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> .1 Option 1 is the most similar to the current SOLAS definition, except that the reference to Inmarsat has been deleted.
>
> .2 Option 1 does not facilitate the introduction of non-geostationary satellite systems.

.3 The boundary between sea areas A3 and A4 would depend upon the satellite system used and could be different for different ships.

OPTION 2

"*Sea area A3*" means an area, excluding sea areas A1 and A2, within the coverage of a recognized mobile satellite communication service in which continuous alerting is available between [70][76] degrees North and South.

"*Sea area A3-[R][Regio][Regional][Sub]*" means a sub-area within sea area A3, within the regional coverage of a recognized mobile satellite communication service in which continuous alerting is available.

"*Sea area A4*" means an area outside sea areas A1, A2 and A3.

"*Sea area A4-R*" means a sub-area within sea area A4, within the regional coverage of a recognized mobile satellite communication service in which continuous alerting is available.

Comments on Option 2:

.1 Option 2 defines a clear boundary for the A3 sea area and, as such, might be helpful to an Administration in issuing safety radio certificates to ships.

OPTION 3

"*Sea area A3*" means an area, excluding sea areas A1 and A2, within the coverage of a recognized mobile satellite communication service in which continuous alerting is available as may be defined by the Organization.

"*Sea area A4*" means an area outside sea areas A1, A2 and A3.

Comments on Option 3:

.1 Option 3 defines the sea area A3 as somewhere where satellite coverage is available.

.2 The boundary between sea areas A3 and A4 would depend upon the satellite system used and could be different for different ships.

.3 The safety radio certificate would require details of the geographical area in which the ship is permitted to sail.

.4 Availability of a global satellite system would result in not having a sea area A4 for ships that are certificated to use a global system.

Port State control procedures if sea areas are changed

31 In future, if other satellite service providers are recognized by the Organization, the safety radio certificates of the ship should be required to define the geographic area in which the ship is permitted to operate. The detail of the geographical areas covered by all the different satellite service providers will be given in the GMDSS Master Plan.

Follow up

32 The definition of the different areas of carriage requirements (sea areas) and port State control procedures will be further considered under the detailed review.

Separation of distress communications from other types of communications

33 As described in paragraph 17 it was concluded that "security-related communications" and "other communications" could be separated from distress and safety communications. No further revisions to the arrangements in other chapters of SOLAS were considered to be necessary at this time.

Future need to allow for differences for certain categories of ships, including non-SOLAS ships

34 After WRC-07, Articles 30 through 34 of the Radio Regulations contain provisions for operational use of the GMDSS, which apply to all ships of all types. SOLAS chapter IV includes GMDSS radio equipment requirements and applies to cargo ships of 300 gross tonnage and upwards and to passenger ships, on international voyages. Under regulation I/3, the following types of ships are excluded:

(i) ships of war and troopships
(ii) cargo ships of less than 500 gross tonnage (note: this exemption is expressly brought down to 300 gross tonnage in chapter IV)
(iii) ships not propelled by mechanical means
(iv) wooden ships of primitive build
(v) pleasure yachts not engaged in trade
(vi) fishing vessels

The Organization also has Codes (DSC, SPS, MODU and HSC Codes) and other instruments such as the Torremolinos International Convention for the Safety of Fishing Vessels, 1977 (with the its 1993 Protocol and the 2012 Cape Town Agreement) containing requirements for carriage of radio equipment for certain other types of ships.

35 It was suggested that one way to bring consistency to the GMDSS across all types of ships, would be to create a GMDSS Code, which could be applied as mandatory to ships under SOLAS chapter IV, as well as various codes. It could be advisory for other types of ships and serve as a recommendation to governments for application to their domestic services.

36 However, it was concluded that at the present time, there is no compelling case for the development of a GMDSS Code. Developing such a code would require addressing the complex issues that would arise from the various instruments that require the carriage of radio equipment. Each of these would then need to be revised to reference the code.

37 Further items for possible consideration in the detailed review could include:

.1 relating distress signals in COLREGs to SOLAS chapter IV and requiring SOLAS Convention vessels to relay a distress alert from non-Convention vessels to shore;

.2 the need for all equipment working in the GMDSS system to be type approved, to ensure that it meets compatible standards;

.3 reduction in the applicable tonnage limits for SOLAS chapter IV, applicable functional requirements to non-Convention ships as currently defined, maintenance of equipment and qualification of personnel; and

.4 use of personal devices, such as Man Overboard Devices (MOBs), etc., and protection of the integrity of the GMDSS.

Review of existing systems considered for replacement, and existing and new systems for inclusion in the modernized GMDSS

38 A number of new communication technologies and systems have been developed since the introduction of the GMDSS, which are currently not included in the GMDSS. They offer potential improvements and advantages. The following equipment and systems, among others, might be included in the modernized GMDSS:

.1 AIS;
.2 HF Email and data systems;
.3 VHF data systems;
.4 Application Specific Messages over AIS;
.5 NAVDAT (500 kHz and/or HF);
.6 Modern satellite communication technologies;
.7 Additional GMDSS satellite service providers;
.8 Hand-held satellite telephones in survival craft;
.9 Hand-held VHF with DSC and GNSS for survival craft;
.10 Man Overboard Devices;
.11 Cospas-Sarsat MEOSAR system; and
.12 AIS and GNSS-equipped EPIRBs.

39 Other systems including mobile internet services, mobile telephone services, broadband wireless access (BWA), e.g. Wimax/mesh networks wireless Local Area Networks and non-regulated Satellite Emergency Notification Devices (SENDs), are more and more used by the public including non-SOLAS ships. These systems do not seem to have a place in the modernized GMDSS.

40 It was therefore concluded that there are a number of new communication systems and equipment that might be part of a modernized GMDSS, However, until the detailed review of the GMDSS is completed it is too early to decide which systems and equipment would or would not be included. Similarly, it is too soon to decide which systems, relying on older or inefficient technologies, might be considered for replacement by more modern systems.

Possible alignment between chapters III, IV, V and XI-2 of SOLAS and the use of goal-based methodologies

41 There are differences in arrangements with regard to type approval, secondary equipment and maintenance arrangements and the regulatory status in SOLAS chapters III, IV, V and XI-2. Other SOLAS chapters are also trending toward using goal-based methodologies in order to provide the maximum possible flexibility for designers, and to allow for innovation.

42 With respect to the GMDSS and communications in general, interoperability is required between ships and between ships and shore stations. In the course of the High-level Review, as well as in the work on the e-navigation strategy, there have been numerous calls for standardized user interfaces.

43 However because of the need for interoperability of radiocommunications between ships and between ships and shore stations, as well as the need for consistent user interfaces, alignment with other SOLAS chapters and the use of goal-based methodologies is not appropriate.

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