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Agenda item 3

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GLOBAL MARITIME DISTRESS AND SAFETY SYSTEM (GMDSS)

Scoping exercise to establish the need for a review of the elements and procedures of the GMDSS

Report from the GMDSS Task Force on elements for GMDSS modernization scoping exercise

Submitted by the United States

SUMMARY

Executive summary:	This report summarizes the efforts of the GMDSS Task Force and the RTCM Assembly towards establishing issues to be considered during the GMDSS scoping exercise
Strategic direction:	5.2
High-level action:	5.2.5
Planned output:	5.2.5.10
Action to be taken:	Paragraph 21
Related document:	COMSAR 14/WP.5/Add.1

Introduction

1 The MSC has added an agenda item for COMSAR to address GMDSS modernization via a scoping exercise to be completed during COMSAR 15 and COMSAR 16.

2 Preliminary work was done on the modernization issues during COMSAR 14. Based on input papers and work at the meeting, 41 issues were identified for possible consideration by the next meeting of the Joint IMO/ITU Experts Group (JEG).

3 For many years there has been a GMDSS Task Force in the United States to address issues by an open dialogue among government agencies, industry, users and others. The Task Force has an extensive e-mail distribution list, and it has benefitted from inputs from many sources. It has a close relationship with the Radio Technical Commission Maritime (RTCM), National Marine Electronics Association (NMEA) and others. Frequently, the Task Force makes formal and informal inputs to United States governmental regulatory agencies.

4 Several events of interest to the Task Force occurred at the recent RTCM Assembly on 17 and 18 May 2010:

.1 a number of very informative papers were presented concerning GMDSS issues; these are available at the website www.rtcm.org;

.2 a meeting of the Task Force to discuss issues; this was one of four meetings held in the last year; and

.3 a GMDSS modernization workshop that allowed a wide ranging discussion of GMDSS modernization issues.

5 Task Force GMDSS Modernization Workshop Summary:

.1 reviewed the 41 modernization issues generated by COMSAR 14;

.2 reviewed information previously gathered from users;

.3 reviewed comments by ship operators which had been solicited in advance;

.4 concluded there continues to be a compelling need for inputs from GMDSS users and providers for COMSAR's deliberations;

.5 discussed papers presented at the Assembly. These included,

i. several papers on applications of the Automatic Identification System (AIS) which is not technically a GMDSS system but which has many useful applications which can enhance GMDSS; and

ii. presentations on alternative satellite systems not presently part of GMDSS which likewise have clear potential for GMDSS augmentation;

.6 decided to create its assessment of the most important issues among those 41 identified by COMSAR 14 as an output;

.7 agreed to provide this assessment of priorities to the JEG for their consideration; please note this input will be from the workshop and has no official standing from any administration or other organization;

.8 approved a summary compilation of the 41 issues into broad affinity groups to facilitate consideration of similar issues;

.9 examined the top issues and discussed them in some detail; and

.10 emphasized that incremental progress on key issues should continue with urgency while the scoping work is being completed and approved.

6 Annex A contains the 41 issues developed by COMSAR 14 and the affinity groups; an * indicates the workshop concluded this issue belongs in the top priorities.

Discussion

7 While there was not unanimous agreement in the workshop conclusions, there was a broad consensus. The following are the most important issues; ranking among them was not done. There was agreement about the critical need to make progress on the Digital Selective Calling (DSC) issues as the first priority. Inputs about difficulties with DSC continue to be received, and its reputation has a deleterious effect on the overall reputation of the GMDSS. The following issues which had strong support at the Workshop have been selected for recommendation to the JEG.

8 Procedural Considerations. The scoping effort for GMDSS Modernization is too large to be pursued during regular COMSAR meetings. At COMSAR 14, the issue was assigned to an already overloaded Working Group, which recommended the JEG meeting in September be invited to consider GMDSS Modernization. That meeting is only scheduled for 3 days, which does not allow time for significant action. It is recommended that the IMO schedule one or more intersessional meetings on Modernization or, lacking that, commission a Correspondence Group to work by e-mail and report to COMSAR at each session. After initial modernization adjustments, continuing development could be managed by a special COMSAR Modernization Panel functioning much as the NAVTEX and SafetyNet Panels presently operate. Workshop participants at the RTCM Assembly agreed to continue correspondence via e-mail and invited others to join.

9 Medium Frequency Digital Selective Calling (DSC). Despite delays in upgrading the United States coastal watch on 2 MHz DSC and an uncertain funding forecast, there appears to have been a higher level of usage of the 2 MHz system (without DSC) in recent years and to the extent that domestic users may be required to upgrade to DSC, a more reliable performance of the system can be expected. The principal motivations for continuing with the upgrade are to improve coverage, facilitate ship-to-ship usage at ranges greater than Very High Frequency (VHF), improve Coastal Marine Safety Information (MSI) Broadcasts, and to better support the primary users in the commercial fishing industry. It would then follow that the United States should support retention of 2 MHz DSC in the GMDSS system, which is also the likely position of nations without plans for a coastal watch on VHF-DSC. By advocating retention of Sea Area A2, there is an implicit recommendation for retaining all four Sea Areas. There was a strong consensus that progress should be continued in resolving DSC issues as the scoping work is done and approved.

10 Alternative Satellite Systems. There has long been interest in including additional satellite systems in the GMDSS. IMO's procedures for including additional participants, resolution A.1001(25), needs revisions to remove barriers and encourage others to join. The Assembly received a very interesting presentation about the Iridium System promising global coverage including the Arctic Ocean where there is expanding navigation in the region. Once systems are introduced and tested successfully in the Polar Regions, the need for Medium Frequency (MF) to cover these regions would be reduced or eliminated. Subsequent to the Assembly, Iridium announced plans for its next generation system and awarded a contract to build it. Thuraya's presentation provided exceptionally useful information about how a regional system could add much value for maritime safety, security and pollution prevention. IMO should establish performance parameters including watch standing, redundancy, and connectivity to the MRCC/RCC network. Candidate satellite systems need not be able to perform all functional requirements such as broadcasting of MSI since ships can still be required to watch NAVTEX and SafetyNet. Acceptance of alternative satellite systems would also strengthen the concept of allowing ships to utilize systems they already use for business, to meet their safety requirements. An equitable oversight cost sharing arrangement would be necessary via IMSO.

11 Use of Four Levels of Priority in Radiocommunications. This traditional requirement originated when it was appropriate to give Morse Radio Operators aboard ships and ashore, guidance on the relative priority of messages which sometimes had to be queued for manual transmission. With the modern systems now in use and the high degree of automation, it is no longer necessary to have four levels. A single category of "Priority" for communications relating to distress and the safety and movement of shipping, with provisions of availability speed of service and service availability would be adequate. Some further work will be necessary to specify which type of Priority messages warrant being sent from shore to ship and from ship to ship preceded by an alerting signal to activate shipboard alarms.

12 Retention of All GMDSS Functional Requirements. The review of functional requirements in the GMDSS validated most of the functional requirements but, "General Communications" needs further consideration. This function was intended to enable ships to utilize those systems they used for ships business and for safety communications as well, with the expectation that the operators would not need repetitive training for systems they used routinely. The GMDSS VHF/MF/HF DSC services previously had a Public Correspondence component which provided voice and record general communications. Unfortunately most have since been terminated for economic reasons.

13 Use of AIS for Distress Alerting and Messaging. The expanding use of AIS for distress alerting and safety-related messaging under the concept of e-navigation calls attention to the present reluctance to endorse that same messaging capability for distress alerting. This reluctance is based on there not being a dedicated watch on the channel despite the fact that all SOLAS ships and others sail with AIS operational. AIS safety-related messages are not designed for the purpose of distress alerting (Safety-related messages are transmitted with a priority 2 in a 4 priority system and do not use the Self Organizing Time Division Multiple Access (SOTDMA) reserved slot process normally used by AIS (see ITU-R M.1371-4 Table 43)). Therefore, AIS safety messages may not be reliably received where AIS traffic loading is high. Messages requiring multiple slots are especially vulnerable. On the other hand, ITU Regulations make it clear that a ship may make use of any radio capability to issue a distress alert. The AIS position report message navigational status could be adapted to include a distress alerting capability. The consensus was that it is time to agree that AIS can be used for distress alerting and safety-related messaging, with the proper technical modifications.

14 Use of AIS as an Alternative to the 121.5 MHz EPIRB Homing Signal. This proposal has been considered by COMSAR because of its clearly superior performance, but it was not adopted at the last session due to concerns of some administrations that few aircraft were equipped to home on the AIS signal. This enhancement is considered too beneficial for further delay. Because the EPIRB power budget will not economically support both homing options, it is recommended that COMSAR accept the AIS homer as an alternative to the 121.5 MHz homing beacon in the same fashion that the AIS SART was accepted as an alternative to the Radar SART.

15 Inclusion of AIS, SSAS, and LRIT in the GMDSS System. Recognizing the case for AIS as outlined in the preceding paragraphs, it should be declared a GMDSS system in addition to its other applications for safety of navigation. In the same fashion, the IMO created the Ship Security Alerting System (SSAS) and the Long-Range Identification and Tracking (LRIT) system; both have clear safety and distress applications. All three should be declared GMDSS systems and thus subject to the IMO requirements for reserve power, annual inspections, and operator training.

16 Enhancement of Safety Communications for Survival Craft. There have been numerous suggestions that along with GMDSS Modernization there should be an overhaul of lifesaving communications on survival craft. The voluntary radio equipment carried on large cruise ship lifeboats (especially those used as tenders) already far exceeds the IMO requirements, often including fixed mount Very High Frequency (VHF) and High Frequency (HF) radios and radar. At the other end of the scale, the United States National Transportation Safety Board (NTSB) has recommended that small craft carrying passengers for hire carry VHF portables as a minimum. Updating the IMO rules for Life-saving Appliances will, of course, need to be coordinated with the Design and Equipment (DE) Sub-Committee. It is recommended that to begin the process, input papers on the issue be submitted to COMSAR to be coordinated with the DE Sub-Committee providing for fixed mount VHF radios and AIS for all self-propelled lifeboats and VHF portables with integral GNSS for other survival craft. The option to include a handheld satellite phone should also be included.

17 Modernization of GMDSS MSI Broadcasting. There is a general need to prepare for a transition to make MSI available on websites for use by mariners. This is often referred to as "pulling" MSI as opposed to "pushing" by broadcasting. Of the broadcasting systems, currently available NAVTEX coastal broadcasts are overloaded and too slow, SafetyNET broadcasting to the high seas seems generally adequate, and HF broadcasting is done by very few countries and the extent of its usage by ships is hard to evaluate. More specifically, the NAVTEX system needs to transition to a much higher data rate to accommodate the volume of coastal warnings being broadcast. While the SafetyNet system can handle present volumes, we need to monitor implementation of broadcasting MSI by Inmarsat Fleet Broadband, which may overcome the problem of having to track specific satellites for intended reception. As means are provided to allow more data to be "pulled" more easily by shipping, it may be possible to reduce the amount of data now being "pushed" to ships by systems such as NAVTEX, Inmarsat SafetyNET and by voice broadcasts. As a start toward "pulling" MSI by ships, originators of MSI broadcasts should ensure that all broadcast material is maintained on websites as soon as released and for at least 30 days after cancellation to facilitate training and forensic analysis. The Inmarsat representative presented a very useful paper discussing this subject at the RTCM Assembly. Workshop participants noted IMO/IHO/WMO groups are working very effectively on these issues, and a possible conclusion of the scoping task could be to just continue to follow the work of these groups. When GMDSS functional requirements are considered, interoperability among all these classes of vessels needs attention.

18 Accommodation of e-navigation in GMDSS Modernization. The emerging concept of e-navigation is likely to utilize many of the same communication systems used for GMDSS, especially VHF which is already heavily loaded. In addition, the expanding e-navigation requirements overlap in some cases such as the use of MMSI identifiers. Integration of radar and AIS displays on electronic charts invites further integration of MSI warnings as well. New requirements for cargo security monitoring and special broadcasting services make a strong case for dealing with e-navigation requirements and GMDSS modernization together. There was a divergence of opinions at the workshop about the relationships between the two initiatives. Some stated COMSAR needs should be fully developed independently and then discussed in the context of e-navigation initiatives rather than emphasizing a parallel effort.

19 Recognizing the Needs of Non-SOLAS Vessels in GMDSS Modernization. While GMDSS requirements apply only to SOLAS vessels, it is customary for most administrations to apply some of the GMDSS requirements to non-SOLAS vessels under domestic regulation (i.e. yachts and domestic coastal vessels). This is especially important to Administrations with large numbers of recreational vessels and rather modest SOLAS fleets. The IMO has

recommended guidelines for fishing vessels of various sizes, but some Administrations have not followed those guidelines. Simplification of GMDSS requirements and recognition of alternate satellite systems will provide more options for improving the safety of non-SOLAS vessels.

20 Improving the HF Communications Option in GMDSS Modernization. Many ships use the satellite option for GMDSS communications due to reliability and operating simplicity, but the HF option is still preferred by those ships looking for lower cost alternatives or operating in Sea Area A4. False alerts continue to be prevalent in the HF systems due to system complexity and poor operator training. The Inmarsat and Cospas-Sarsat systems also experience false alerts but benefit from an aggressive follow-up by their system management. Unfortunately, there is no central authority to follow up on HF false alerts unless the individual countries operating HF Coast Stations adopt their own aggressive follow-up programme including coordinating with the flag States of offending ships. The Scoping exercise output should propose a broad plan for participating administrations to follow up on false alerts including a report to each session of COMSAR. It should also consider how commercial HF providers could become part of the GMDSS.

Action requested of the Sub-Committee

21 The Sub-Committee is invited to note the information in the GMDSS Modernization Scoping Exercise.

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ANNEX

The following is for general consideration for the discussion on GMDSS modernization. No actions are requested, but the information does present a framework for productive discussions. Items with an (*) indicate issues that should be considered high priority.

COMSAR 14's modernization issues

Suggested issues to be examined for each of the items listed below:

.1 What is the priority of this item compared to the other 40 in terms of making a difference on the water for safety and security?

.2 Is this within the sole purview of the IMO, or are other organizations involved? If so list them.

.3 Is this a candidate for incremental action while the scoping work is in progress?

.4 Documentation that is already available concerning this issue should be listed.

.5 What additional info is needed for consideration of the issue, and how can it be collected?

.6 How should this issue be addressed during the scoping task work?

ISSUES

1 * The further development of the list of areas requiring closer attention to fully frame the requirement for a review of the GMDSS.

2 The extent for the review including the shape, size and structure of this review.

3 How the review may be implemented.

4 The development of a work plan outlining how the review would be undertaken, its format and timescales working towards completion.

5 Facilities required for capacity building.

6 Whether to look at a goal-based approach to the review of SOLAS chapters IV and V and the STCW Convention's wording instead of a prescriptive approach for regulations and the regulatory framework.

7 * The relationships with the development of e-navigation.

8 Which basic communication capabilities are properly part of the GMDSS and which should become a part of the developing e-navigation concept?

9 * The need for the establishment of a correspondence group to work intersessionally between COMSAR 15 and COMSAR 16 and the Terms of Reference for that group.

10 * The need for the current order of priorities in use for Radiocommunications.

11 The introduction of an advance notice message for circumstances where the state of this ship and/or crew was uncertain.

12 The reduction of the four different areas of carriage requirements.

13 The need to clearly separate distress communications from other types of communications.

14 A requirement to allow differences for certain categories of ships.

15 The issue of training and performance of crews on board ships.

16 * That over the years GMDSS had become the distress and safety system for non-SOLAS ships as well.

17 * New developments, mainly by non-GMDSS communication providers, as well as the use of mobile phones and regional satellite systems.

18 The creation of a forum in the future, to keep the system modern and up to date, and whether the COMSAR Sub-Committee, which meets only once a year, would be the right body.

19 * The need to investigate the views of seafarers on possible improvements of distress and safety communications on board ships.

20 The development of a clearer definition of "General Communications", which continues to cause some confusion in the marketplace.

21 * AIS safety-related messaging, the role of NBDP and the role of MF/HF DSC.

22 Problems that might arise due to a lack of HF stations in the future.

23 A continued need for a 2 MHz distress system, upon which GMDSS Sea Area A2 would be based.

24 The false alert rate for VHF DSC, which remains unacceptably high.

25 The continued use of voice communications as an integral part of the GMDSS, benefitting search and rescue operations.

26 Improvements of VHF equipment used in the sea areas A1 to embrace more modern digital technology.

27 Measures which could or should be taken to encourage additional service providers to enter the GMDSS.

28 The need for continuing protection for the necessary spectrum for satellite-based radio-communication service for the GMDSS.

29 * The possible establishment of a requirement to carry a suitable hand-held satellite telephone terminal in some or all life rafts, and how its power supply could be assured.

30 The evolution of more efficient satellite EPIRB systems and equipment designs.

31 * The need for inclusion of the Ship Security Alert System (SSAS) in the GMDSS suite of equipment.

32 * The further evolution of Maritime Safety Information broadcast systems.

33 The potential benefit of permitting the use of regional satellite systems in ships that trade only within a restricted area, limited to the footprint of such systems.

34 The use of satellite equipment as an alternative in sea areas A2 currently based around MF/HFDSC.

35 Additional spectrum requirements.

36 Transitions to a complete new numbering scheme (partly) replacing the current assignment and use of maritime mobile service identities (MMSI numbers). (Note: may require another item on MMSI evolution.)

37 Inconsistencies between SOLAS chapters IV and V, in particular with regard to type approval, secondary equipment and maintenance arrangements.
(Note: reserve power and inspections are issues as well.)

38 The need to change the title of chapter IV to distress communications and to transfer non-distress related communications to other chapters, as well as transferring all distress related communications to chapter IV.

39 The need to clarify the difference between power supplies for the GMDSS equipment and other equipment on the bridge.

40 The need for impact analysis of the cost, as well as any amendments to the legislation and administrative that may come about.

41 The need to insure the benefits that emerge include enhancement of safety, security, environmental protection and general communications for the industry.

CATEGORIES

GMDSS Areas

1 The further development of the list of areas requiring closer attention to fully frame the requirement for a review of the GMDSS. (1 & 12)

2 A continued need for a 2 MHz distress system, upon which GMDSS Sea Area A2 would be based. (23)

3 The use of satellite equipment as an alternative in sea areas A2 currently based around MF/HFDSC. (1)

Procedural issues for scoping work

1 The extent for the review including the shape, size and structure of this review. (2)

2 How the review may be implemented. (3)

3 The development of a work plan outlining how the review would be undertaken, its format and timescales working towards completion. (4)

4 Facilities required for capacity building. (5)

5 The need to look at a goal-based approach for review of SOLAS chapters IV and V and the STCW Convention's wording instead of a prescriptive approach for regulations and the regulatory framework. (6, 37, 38, 41)

6 The need for the establishment of a correspondence group to work intersessionally between COMSAR 15 and COMSAR 16 and the Terms of Reference for that group. (9)

7 A requirement to allow differences for certain categories of ships. (14) (Note: IMO already recognizes some different categories – FV & MODUs and high speed craft).

8 The growing use of GMDSS as a distress and safety system for non-SOLAS ships. (16)

9 The need for a forum to keep the system modern and up to date and whether the COMSAR Sub-Committee, which meets only once a year, would be the right body. (18)

10 The development of a clearer definition of "General Communications", which is continuing to cause some confusion in the marketplace. (20)

11 The need for impact analysis of the cost as well as well as any amendments to the legislation and administration that may come about. (40)

e-Nav relationships

1 The role of GMDSS in the development of e-navigation. (7)

2 Which basic communication capabilities are properly part of the GMDSS and which should become a part of the developing e-navigation concept? (8)

3 The need to clearly separate distress communications from other types of communications. (13)

4 The need to clarify the difference between power supplies for the GMDSS equipment and other equipment on the bridge. (39)

Technical issues

1 The need for the current order of priorities in use for Radiocommunications. (10)

2 The introduction of an advance notice message for circumstances where the state of this ship and/or crew was uncertain. (11)

3 AIS safety-related messaging, the role of NBDP and the role of MF/HF DSC. (21)

4 Problems that might arise due to a lack of HF stations in the future. (22)

5 The false alert rate for VHF DSC, which remains unacceptably high. (24)

6 That continued use of voice communications as an integral part of the GMDSS, benefitting search and rescue operations. (25)

7 Improvement of VHF equipment used in the sea areas A1 to embrace more modern digital technology. (26)

8 The evolution of more efficient satellite EPIRB systems and equipment designs. (30)

Incorporation of other capabilities

1 New developments, mainly by non-GMDSS communication providers, as well as the use of mobile phones and regional satellite systems. (17)

2 AIS safety-related messaging, the role of NBDP and the role of MF/HF DSC. (21)

3 Measures which could or should be taken to encourage additional service providers to enter the GMDSS. (27)

4 The possible establishment of a requirement to carry a suitable hand-held satellite telephone terminal in some or all life rafts, and how its power supply could be assured. (29)

5 The need for inclusion of the Ship Security Alert System (SSAS) in the GMDSS suite of equipment. (29)

6 The further evolution of Maritime Safety Information broadcast systems. (32)

7 The potential benefit of permitting the use of regional satellite systems in ships that trade only within a restricted area, limited to the footprint of such systems. (33)

Spectrum requirements

1 The need for continuing protection for the necessary spectrum for satellite-based radio-communication service for the GMDSS. (28)

2 Additional spectrum requirements. (35)