

**Report of the Correspondence Group on the Review of the GMDSS**

Submitted by IHB

**SUMMARY**

Executive Summary: This document contains the draft Outcome of the Detailed Review of the Global Maritime Distress and Safety System.

Action to be taken: Paragraph 2.

Related documents: NCSR 3/14 dated 11 December 2015

1. See attached document.
2. The Sub-Committee is invited to note the information provided and take action as appropriate.

SUB-COMMITTEE ON NAVIGATION,  
COMMUNICATIONS AND SEARCH AND  
RESCUE  
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Agenda item 14

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**COMPLETION OF THE DETAILED REVIEW OF THE GLOBAL MARITIME DISTRESS  
AND SAFETY SYSTEM (GMDSS)**

**Report of the Correspondence Group on the Review of the GMDSS**

**Submitted by the United States**

**SUMMARY**

<i>Executive summary:</i>	This document contains the draft Outcome of the Detailed Review of the Global Maritime Distress and Safety System
<i>Strategic direction:</i>	5.2
<i>High-level action:</i>	5.2.5
<i>Output:</i>	5.2.5.2
<i>Action to be taken:</i>	Paragraph 6
<i>Related documents:</i>	NCSR 1/23; NCSR 2/9/Rev.1, NCSR 2/WP.5; EG 11/4, EG 11/4/1 and NCSR 3/17

**Introduction**

1 NCSR 2 considered the outline of the Detailed Review of the Global Maritime Distress and Safety System (GMDSS) (NCSR 2/9/Rev.1). After discussion in the Communications Working Group (NCSR 2/WP.5), the Sub-Committee re-established the Correspondence Group on the Review of the GMDSS (CG) with the following terms of reference:

- .1 develop proposals on issues identified at NCSR 2, including:
  - .1 considerations of the costs associated with the approval of additional GMDSS service providers; and
  - .2 development of reliable and correct data regarding shoreside infrastructure for MF/HF communications system;

- .2 develop the document containing the draft outcome of the detailed review, taking also into account the outcome of NCSR 1 and of the 10th meeting of the Experts Group, which took place in 2014;
- .3 submit an interim report to the Joint IMO/ITU Experts Group on Maritime Radiocommunication Matters (5 to 9 October 2015) for its consideration; and
- .4 taking into account the outcome of discussions in the Joint IMO/ITU Experts Group on Maritime Radiocommunication Matters, submit a report, including the document containing the (revised) draft outcome of the detailed review to NCSR 3 by 11 December 2015.

2 In response to the terms of reference, the CG prepared an interim report including a Preliminary Draft of the Outcome of the Detailed Review for consideration by the Joint IMO/ITU Experts Group (EG 11/4/1). The Experts Group discussed the Preliminary Draft Outline in detail. Using the outcome of that discussion, the CG produced the draft Outcome of the Detailed Review in annex 1, for consideration and approval. It should be noted that, at present, the Detailed Review does not propose any new carriage or retrofit requirements for ships, although it does suggest consideration of a requirement for all lifeboats and at least some liferafts to be equipped with Search and Rescue Transponders (SARTs). Some communication equipment will evolve over time to use newer technologies.

3 The annex to annex 1 is a preliminary list of IMO instruments to be reviewed for GMDSS modernization. This list appeared as annex 2 to document NCSR 2/9/Rev.1, but it is updated here with some instruments removed and some additional instruments to be considered. Comments in the "Notes" column are provided to describe revisions that may be required.

4 Annex 2 is a listing of elements that were considered in the course of development of the Detailed Review, and that were not included for one reason or another. References are included to documents where these items are discussed.

5 The coordinator of the CG would like to thank the following Member States, intergovernmental organizations, governmental and non-governmental organizations for their participation in the CG: Argentina, Australia, Brazil, Bulgaria, China, Denmark, Finland, France, Germany, Greece, Iran (Islamic Republic of), Italy, Japan, the Republic of Korea, Liberia, the Marshall Islands, the Netherlands, Norway, Poland, Portugal, South Africa, Spain, Sweden, Turkey, Ukraine, the United Arab Emirates, the United Kingdom, the United States, the European Commission, BIMCO, CIRM, ICS, IEC, IMSO, IMRF, ISO, ITF, the Nautical Institute, ITU and WMO.

#### **Action requested of the Sub-Committee**

- 6 The Sub-Committee is invited to:
- .1 approve the draft Outcome of the Detailed Review in annex 1;
  - .2 note the preliminary list of instruments to be reviewed, as set out in the annex to annex 1, and recommend revisions, as appropriate; and
  - .3 note the list of items not to be included in the GMDSS modernization programme, as set out in annex 2.

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## ANNEX 1

### REVIEW AND MODERNIZATION OF THE GMDSS

#### Outcome of the Detailed Review of the GMDSS

## 1 Introduction

1.1 The Global Maritime Distress and Safety System (GMDSS) was adopted as part of the 1988 Amendments to the Safety of Life at Sea Convention (SOLAS). It was fully implemented in 1999. It has served the mariner and the maritime industry well since its inception, but some of the GMDSS technologies used have not reached their full potential, and some GMDSS functions could be performed by more modern technologies.

1.2 In addition to ships required to meet GMDSS requirements under regulation IV/1 of the SOLAS convention, other vessels (non-SOLAS vessels) also benefit from the GMDSS because search and rescue (SAR) communications are part of the GMDSS. Many national Administrations require non-SOLAS vessels to be equipped with GMDSS equipment, or equipment compatible with the GMDSS including some of the recommendations and standards of the ITU and IEC. The existing GMDSS architecture ensures that a ship in distress anywhere should always be heard and responded to. It encompasses a unique combination of international technical and operational standards and recommendations, and further a globally coordinated use of frequencies, for both on board ships and on shore.

1.3 In 2012, the Maritime Safety Committee approved a new unplanned output on the Review and modernization of the GMDSS (MSC 90/28, paragraph 25.18). The project includes a High Level Review (NCSR 1/28, annex 10), a Detailed Review (this report) and a Modernization Plan. The work was initially coordinated by the Sub-Committee on Radiocommunications, and Search and Rescue (COMSAR), with contributions from the Sub-Committee on the Safety of Navigation (NAV), and the Joint IMO/ITU Experts Group on Maritime Radiocommunication Matters (Experts Group). In 2013, the COMSAR and NAV Sub-committees were merged into the Sub-Committee on Navigation, Communications and Search and Rescue (NCSR) which carries on the work along with the Sub-Committee on Human Element, Training and Watchkeeping (HTW), and supported by the Experts Group and the ICAO/IMO Joint Working Group on Harmonization of Aeronautical and Maritime Search and Rescue.

1.4 This Detailed Review took place from 2013 to 2016. It builds on the outcome of the High Level Review of the GMDSS (NCSR 1/28, annex 10) and sets the agenda for the Modernization Plan. As a result of the Detailed Review, no new carriage or retrofit requirements for ships are proposed, although consideration of a requirement for all lifeboats and at least some liferafts to be equipped with SARTs is recommended. Some equipment will evolve over time to use newer technologies, and updates of equipment may be necessary as a result of decisions of future competent ITU World Radiocommunication Conferences (WRCs), e.g. if spectrum allocation and/or regulatory provisions are amended. Where new technologies are introduced, it is generally intended that ships can use existing equipment as long as that equipment is serviceable.

## 2 Additional satellite systems in the GMDSS

2.1 Inmarsat has been the sole provider of GMDSS satellite communication services since the inception of the GMDSS. Resolution A.1001(25) sets out the criteria for the provision of mobile satellite communication systems in the GMDSS and reflects that the Assembly had

noted that future mobile satellite communication systems might have the potential to offer maritime distress and safety communications. Resolution A.1001(25) did not anticipate all of the issues that might arise with the introduction of additional satellite systems.

### *Interoperability*

2.2 Concerns were expressed about interoperability, referring to "the ability to conduct ship-to-ship, ship-to-shore, and shore-to-ship communications without regard to differing satellite systems in use by the communicating stations". However, when resolution A.1001(25) was developed, the issue of interoperability was discussed in depth, and it was recognized that this would mean more complexity than when operating with a single provider. This is actually not a new situation raised by the introduction of additional GMDSS satellite service providers. For instance, it is not necessary for a Rescue Coordination Centre (RCC) to have an Inmarsat terminal to communicate with a ship using the Inmarsat satellite system. The connection can be completed through the Public Switched Telephone Network (PSTN), although dedicated land lines may also be used. Similarly, current SafetyNet Maritime Safety Information (MSI) providers do not need to have Inmarsat terminals to provide their broadcasts. This would also be the case for additional satellite systems. Ships with different satellite systems are also connected to each other through the PSTN as well as the terrestrial radio services required in SOLAS regulations IV/10.1.2 and 10.2.

2.3 However, NAVAREA coordinators, Sub-Area coordinators and national coordinators under resolution A.706(17), and METAREA coordinators and issuing services under resolution A.1051(27), are required to monitor their broadcasts to ensure that the messages have been correctly transmitted. These requirements are typically met by having the relevant satellite terminals.

2.4 RCCs, as well as NAVAREA and METAREA coordinators, make use of Enhanced Group Calls (EGC). These would have to be duplicated on each GMDSS satellite service. Furthermore, there is no standard EGC message format, so it is possible that EGC messages may have to be reformatted for different satellite systems. This could cause delays where time is of the essence, such as a distress alert relay on short notice.

2.5 Other concerns were raised on using the PSTN and Internet Protocol (IP) for prioritized distress communications. IP telephony and communication, has become more extensively used, but may be more vulnerable than existing PSTN networks. Satellite communications are dependent on shore-to-shore communication systems in use whether PSTN or any other landline links. The current system sometimes relies on the PSTN, but a standard PSTN line or similar may not be sufficient for any shore-based GMDSS communications. In the early Inmarsat-C implementation days there was a requirement that a dedicated (leased) line should be available between the land earth station (LES) and the Rescue Coordination Centre (RCC). Dedicated communication lines or other high availability and reliability connections may be necessary for the shore based network.

### *Cost implications*

2.6 Inmarsat charging policies are covered in resolution A.707(17), which recommends that coast earth stations not be charged for:

- ship-to-shore and shore-to-ship distress traffic;
- urgent ship-to-shore navigational and meteorological danger reports using record communications; and
- medical assistance for persons in grave and imminent danger.

- 2.7 Furthermore, resolution A.707(17) recommends that ships not be charged for:
- meteorological reports;
  - ship position reports; and
  - medical advice and assistance messages other than those referred to in paragraph 0.

2.8 The same charging policies should apply to any new GMDSS satellite service provider.

2.9 Land stations and ships typically subscribe to Inmarsat services and pay additionally for the amount of voice and data services they receive or transmit, other than those listed in paragraphs 2.6 and 2.7. The addition of new satellite service providers should allow users to compare service plans and charges, which might result in reduced expenses for them, and might result in a wider range of available services.

2.10 Cost implications for SAR authorities should not change because they should not be charged for distress traffic. They should also not have to install additional mobile earth stations, because they will be able to communicate with ships served by new GMDSS satellite service providers, using existing hardware and systems because they should all be interoperable. However, they may find that it is more efficient to have their own mobile earth station for each GMDSS satellite service provider.

2.11 There could be cost implications for MSI providers. With the exception of urgent ship-to-shore navigational and meteorological danger reports, they pay Inmarsat for the SafetyNet broadcasts. It is to be expected that any new satellite service provider would impose comparable charges. Because the MSI providers would have to provide their broadcasts over all GMDSS satellite systems, the addition of one new satellite service provider could double their costs. A third could triple their costs. A solution would be to add MSI broadcasts to the resolution A.707(17) list that MSI providers are not charged for (see paragraph 2.6). This would mean that satellite service providers would have to recover their costs for this service from the basic subscription fees paid by coast earth stations and ship stations, and consequently those fees might increase.

2.12 Unless there is a reliable way for NAVAREA coordinators, Sub-Area coordinators, national coordinators, and METAREA coordinators and issuing services to monitor their broadcasts indirectly, they would need to obtain and operate terminals for any new GMDSS satellite service provider.

#### *Frequency coordination*

2.13 Concern was expressed regarding frequency coordination. Coordination should be carried out in accordance with the relevant procedures of the Radio Regulations. Any additional necessary frequency coordination should be able to be carried out at WRC-19 to avoid delays in the GMDSS modernization programme. An agenda item to support the introduction of an additional satellite provider into the GMDSS has been included in the agenda of WRC-19.

#### *ITU List V and MARS Database*

2.14 Resolution A.887(21) covers the establishment, updating and retrieval of information in GMDSS databases. This recommendation provides in paragraph 7 of the Annex that "all Inmarsat equipment should be registered with Inmarsat". The implication is that Inmarsat

identities do not need to be included in the databases, even though paragraph 8.11 says that they should include "radio installations (Inmarsat-A, B, C, M, VHF DSC, etc.) for ship and survival craft".

2.15 When records in the MARS database are examined, it is apparent that some ship listings include their Inmarsat identities, and others do not.

2.16 Resolution A.887(21) should be revised to apply to all GMDSS satellite service providers. It is preferred that satellite service provider identities be included in databases such as List V in MARS.

#### *Implications for the Modernization Plan*

2.17 SOLAS chapter IV should be revised to provide for other GMDSS satellite service providers in addition to Inmarsat.

2.18 Possible ways for MSI providers to provide and monitor MSI broadcasts over multiple GMDSS satellite service providers should be identified, with a view to minimizing the costs, or at least the cost increases for MSI providers. Resolution A.707(17) could be revised to provide for shore-to-ship MSI broadcasts without charge to the originator.

2.19 Formatting of EGC should be standardized if possible to minimize delays, and if possible, a way should be found to transmit EGC simultaneously on all GMDSS satellite service providers.

2.20 Resolution A.887(21) should be clarified so as to ensure that satellite service provider identities are included in national databases and List V in MARS.

2.21 IMO instruments applying to Inmarsat should be reviewed and should be revised, if appropriate, to apply to all GMDSS satellite service providers. See the annex for a listing of instruments that are affected.

### **3 Redefinition of Sea Area A3**

3.1 The High Level Review developed several options for revising the definition of Sea Area A3, and left the final decision to the Detailed Review. The revised definition of Sea Area A3 will be:

*"Sea area A3 means an area, excluding sea areas A1 and A2, within the coverage of a recognized mobile-satellite communication service supported by the ship earth station carried on board in which continuous alerting is available."*

3.2 The Communications Working Group at NCSR 2 (NCSR 2/WP.5) identified consequential matters to be considered with regard to the new definition, and the effect on Sea Area A4. Sea Area A3 will be different for each different mobile-satellite communication service. Sea Area A4 is not redefined, but because it is the sea area not included in Sea Areas A1, A2, and A3, it will be different for ships using different mobile-satellite service providers, and would not exist in the case of a satellite service provider with global coverage.

#### *HF carriage requirements*

3.3 One important consequence of the new A3 definition is that it is now a purely satellite service area. The "HF alternative" is still available to a ship which operates beyond Sea Area A2 but does not use a recognized mobile-satellite communication service. Such ships

will now be operating in Sea Area A4 which is no longer just polar regions. HF can also be used in Sea Area A3 as a secondary means of alerting for a ship using a recognized mobile-satellite communication service.

#### *Promulgation of MSI by HF*

3.4 Because the new definition of Sea Area A3 has the consequence that Sea Area A4 is not restricted to the polar areas, careful consideration should go into how it is ensured that the required MSI will be available to all ships, regardless of their choice of equipment and area of operation.

3.5 Currently, with Inmarsat as the only satellite provider for GMDSS, it is assumed that MSI will be available through the Inmarsat EGC service in areas outside NAVTEX coverage (except for the polar areas). In the future, additional satellite providers may become part of GMDSS, and consequently the issue will become slightly more complex. However, this issue is not only related to the modernization process but also to the recognition of new satellite service providers in the existing GMDSS.

3.6 It is not known whether EGC-receive-only equipment will be available for the new satellite systems. If that would be the case, the modernized GMDSS would not require significant changes to the current use of HF MSI. Decisions and assumptions for the availability of "New EGC" and "New EGC-receive-only-equipment" should be made in order to decide on which carriage requirements should be included in the revised SOLAS chapter IV.

3.7 Nevertheless, it would be valuable if the modernized GMDSS would provide for better and more user-friendly means for ships to receive HF MSI and, thereby, giving additional flexibility to the shore-based infrastructure on how MSI is chosen to be distributed. It could, therefore, be considered whether it would be feasible to require "Future NAVTEX receivers" to be combined NAVTEX and NAVDAT receivers, and that they would be required to receive on 490, 500 and 518 kHz and additionally on all designated HF MSI frequencies (see paragraphs 6.1 and 6.3).

#### *Transitional arrangements*

3.8 There should be no difficult transitional problems with respect to the new Sea Area A3 definition. However, ship certificates will need to change. For Inmarsat users, nothing else changes. For future ship certificates for ships operating in A3, the ship's operational area will need to be compared with the provider's service area to determine if the ship will need to be equipped for Sea Area A4. A GMDSS satellite service provider declares its service area when it applies for recognition under resolution A.1001(25).

#### *Obligations for shore authorities provision of services and implications for SAR*

3.9 Shore authorities are obligated to provide MSI in their NAVAREAs for the dissemination of Navigational warnings (resolution A.706(17), as amended), and in the METAREAs for the dissemination of meteorological forecasts and warning to shipping (resolution A.1051(27)). Search and rescue services are provided in Search and Rescue Regions (SRRs) under the responsibility of the coastal States. The redefinition of Sea Area A3 does not affect either of these.

#### *Implications for the GMDSS Master Plan*

3.10 The GMDSS Master Plan (currently GMDSS.1/Circ.17) will need to be revised and possibly reorganized because it lists stations that operate in the various Sea Areas.



*Implications for amendments to Model Courses*

3.11 Mariner training will be affected and amendments to STCW including Model Courses may be required. Model Courses will, in general, need to be revised to reflect the new Sea Area A3 definition and its effect on Sea Area A4, together with other amendments to chapter IV. Mariner training will be affected and amendments to STCW may be required.

*Implications for non-SOLAS vessels*

3.12 Non-SOLAS vessels are vessels that do not fall within the scope of SOLAS regulation IV/1. The redefinition of SOLAS Sea Area A3 should not affect vessels to which regulation IV/1 does not apply.

*Effects on ship's certificates (NCSR 2/9/Rev. 1, paragraphs 6.3 and 6.4)*

3.13 Ship certificates will require definition of the geographical area in which the ship is permitted to operate with respect to Sea Areas A3 and A4. This can be accomplished by indicating the ship's GMDSS satellite service provider in brackets after the "A3", such as "A3 (Worldwidesat)".

3.14 Alternatively, a geographical presentation could be added to the "Record of Equipment" list in the certificates and considered under chapter I, regulations 12, 13 and 14, and matched with the satellite service provider's service area. This seems much more difficult than the option in paragraph 3.13 and is not recommended.

3.15 However, a ship with two different service providers, e.g. Inmarsat and a regional provider, would introduce some complexity. In that case, there would be a need to identify the intersection of the providers' operational areas.

3.16 Administrations, port state control authorities, and classification societies will need to be aware of the change to Sea Area A3/A4, and a suitable transition period needs to be identified for certificates.

*Satellite equipment carriage options*

3.17 As with Inmarsat, ships will need to carry satellite terminals approved to work with their selected service provider.

*Implications for the Modernization Plan*

3.18 SOLAS regulations, including as a minimum IV/2, IV/10 and IV/11, will need to be revised to reflect the revised Sea Areas A3 and A4.

3.19 Determine whether it is possible and feasible to retain the current requirement to be able to receive MSI using EGC (SOLAS regulation IV/7.1.5), taking into account the new definition of Sea Area A3 and the inclusion of new satellite providers in the GMDSS.

3.20 Depending on conclusions under paragraph 3.19, determine whether changes are required to the availability of HF-MSI in certain areas as a consequence of the new definition of Sea Area A3 and the inclusion of new satellite providers in the GMDSS

3.21 Determine the feasibility of combined NAVTEX and NAVDAT receivers, able to receive on 490, 500 and 518 kHz and additionally on all designated HF MSI frequencies.

3.22 The GMDSS Master Plan (currently GMDSS.1/Circ.17) will need to be revised and possibly reorganized and will need to include the service areas for the GMDSS satellite service providers.

3.23 Model Courses will in general need to be revised to reflect the new Sea Area A3 definition and its effect on Sea Area A4, together with other amendments to chapter IV.

3.24 Administrations, port State control authorities, and classification societies need to be informed of the change to Sea Area A3/A4, and a suitable transition period needs to be identified for certificates.

#### **4 The role of MF/HF**

4.1 HF communications would remain the required communication system for Sea Area A4, providing a communication option for those ships that operate outside their satellite/A3 (e.g. regional) areas, or that do not subscribe to a satellite service covering their area of operation. MF DSC and radiotelephony at present are required in Sea Area A3, even when the ship has Inmarsat GMDSS satellite service. This provides a medium-range open channel ship-to-ship communications option for SAR on-scene operations. It is also important to maintain MF/HF communication systems, taking into account the need to have a back-up system in case satellite communication systems fail due to solar events. However, MF/HF communication systems may be also temporarily affected by these events.

4.2 From the GMDSS Master plan, it appears there are 95 HF DSC coast stations and 15 HF NBDP MSI coast stations. From others sources (French hydrography service – SHOM), there are still 30 HF facsimile stations and 330 HF stations dedicated to general radio communication for radiotelephony, radiotelegraphy and data. These numbers are very difficult to verify either by IMO and ITU because the information is based on each Government's declaration. They include dormant or under-utilized stations. And when looking on a world map of the distribution of HF stations, there is clearly a lack of participating HF stations in certain areas. There is no incentive for these stations to provide GMDSS-related communications as well as general radiocommunications because there is no possibility of generating sufficient income. An option for a commercially viable HF service is to combine military, commercial, maritime, land mobile services, etc., and some governmental entities are showing interest in the concept.

4.3 The HF coastal stations of China are operating and playing an important role in maritime safety. The Shanghai HF coast station operating DSC service receives and deals with large quantities of on-air testing from ships operating in the region of the northwest Pacific. The Guangzhou HF coast station operating on general communication channels, provides general and safety services for both merchant ships and large quantities of fishing boats operating in South China Sea. According to the statistical information, the general communication traffic taken by Guangzhou station for fishing boats reached 211,829 minutes in 2013, and 200,593 minutes in 2014. The station completed 5 cases of real distress communication from fishing boats on HF channels in 2013, and 4 cases in 2014.

#### *Distribution of HF stations*

4.4 It appears, from information in the GMDSS Master plan, that HF DSC station distribution does not follow the basic principle for establishing HF DSC coast stations for sea area A3 and A4 as indicated in resolution A.801(19), annex 2, appendix 1. The majority of HF DSC coast stations are located in an area around the Equator. In some regions of the world there is a concentration of HF DSC coast stations and in some other regions, in particular in northern latitudes, there are few HF stations.

4.5 Then, if a majority of HF DSC coast stations are working on all HF bands (i.e. 4, 6, 8, 12 and 16 MHz), there are still some HF coast stations with no long-range HF communication capability in all HF bands. If we take into account the 330 HF coast stations dedicated to general radio communications, we may find some stations to be able to complete a global distribution of HF stations. Hence, the capability to have communication in all HF bands should be required. HF stations should also be fitted with adequate shore-based telecommunication infrastructure to relay a distress call to the appropriate SAR service.

4.6 It appears from this finding that the issue of the distribution of HF stations can only be dealt at an international level with the help of the general methodology that has already been established in resolution A.801(19).

#### *Distress communications*

4.7 To ensure a HF distress alert from a ship will be received ashore, some basic requirements are needed for the HF radio installation of the ship:

- .1 to transmit a distress alert on all HF bands, in order to be sure to reach a HF station at any time of the day and anywhere;
- .2 to have a proper aerial installation; and
- .3 to have a transmitting power at least equal to 250 Watt PEP<sup>1</sup>.

If these conditions are met, different HF coast stations would be able to receive a distress alert from a ship, with the stations receiving the distress alert on a different HF band. The routing of the distress alerts will lead the distress alert to the RCC in charge of the search and rescue region (SRR) where the ship in distress is located. This solution may provide redundant information to the RCC, but this is a simple solution. It relies on the importance of shore-based telecommunication to route the distress alert.

4.8 Selecting a reliable frequency for HF communications is greatly influenced by atmospheric conditions and therefore reliant on the experience of the operator to know what frequency is the best choice for successful HF communications. A solution may be based on an automatic roaming logging of the ship to the appropriate/closest HF coast station. This system would automatically adapt the HF logging to the position, but whatever the time, all HF frequency bands would be used to send a distress alert to the appropriate HF DSC coast station. This solution would reduce the number of HF stations to receive a distress alert, so there is a danger that the appropriate logged HF station is not operative at the time of the distress alert. Without a solution to secure reception (duplication of receiver for instance) the solution in paragraph 4.7 seems to be the simpler.

4.9 Automated frequency scanning and Automatic Link Establishment (ALE) could be a solution to HF communication either on radiotelephony or radiotelegraphy or data transmission. ALE eliminates the need for operators to understand frequency selection based on varying propagation characteristics. Two stations would communicate on HF but without operators knowing on which frequency they are working. Consideration would have to be given to compatibility of DSC and ALE. Digital transmission would simplify the use of text messaging with the help of a dedicated computer.

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<sup>1</sup> These radios are required to have a minimum power of 60 W PEP, but less than 400 W. 250 W seems to be the typical maximum power available for many existing radios.

### *SAR communications*

4.10 Appendix 15 of the Radio Regulations lists frequencies that may be used for distress or safety purposes by mobile stations engaged in coordinated SAR operations (AERO SAR frequencies for instance: 3023 kHz, 4125 kHz, and 5680 kHz). Ship-to-aircraft communication is intended to be short-range, so lower frequencies in the spectrum using the ground wave are appropriate. Resolution 354 of the Radio Regulations, section 8 says, "Any aircraft required by national or international regulations to communicate for distress, urgency or safety purposes with stations of the maritime mobile service shall be capable of transmitting and receiving class J3E emissions when using the carrier frequency 2182 kHz or the carrier frequency 4125 kHz." These frequencies should be sufficient.

### *MSI*

4.11 The HF NBDP MSI coast station and HF facsimile coast station infrastructure may be used for NAVDAT HF with the installation of suitable transmitter equipment. Further studies should be made to check the global coverage of this system based on present infrastructure taking into account the 330 HF stations used for general radio communications. NAVDAT is described in ITU-R Recommendation M.2058. The use of this technology would require coordination by IMO (see sections 0 - 0 for the discussion on the possible use of NAVDAT and implications for the Modernization Plan).

### *General communications*

4.12 There are enough HF coast stations for general communications. But the technology may change the use of HF on board ship in simplifying the operation of HF radio equipment. Frequency scanning/ALE could be a solution as explained above for distress communication, hence tele-medical assistance, radiotelephony, text and data services could be performed on HF smoothly and as a complementary system to satellite communication (HF systems would not have enough capacity for real-time video exchanges).

### *Implications for the Modernization Plan*

4.13 For ensuring reliable global coverage of HF GMDSS in the long term, the technical basis for determining the minimum number of HF GMDSS coast stations and their geographical distribution should be reviewed and, if necessary, consequential changes should be included in resolution A.801(19). The Radio Regulations have already been revised for HF data and 500 kHz is reserved for NAVDAT. Technological improvements can make HF easier to use.

4.14 Consider revising resolutions A.806(19) and MSC.68(68), annex 3, to include a requirement for frequency scanning and/or ALE.

## **5 HF DSC and NBDP in sea area A3**

5.1 The use of NBDP in distress messages for sea areas A3 and A4 is negligible. Australia and Denmark have commented that NBDP for follow-up communications has fallen into disuse. Reception of NAVTEX is widely accomplished today with systems other than NBDP that are able to store and display NAVTEX messages.

5.2 The original purpose of NBDP as follow-up communication was to overcome language difficulties in voice communications. Delegations have reported that NBDP has never been used for this purpose. It is even more unlikely today that any crew in distress would initiate a follow-up communication via NBDP, compared to direct voice communication.

5.3 Users rarely or never use NBDP at all and therefore would most likely have difficulties in using it in an emergency situation.

5.4 At the technical level, HF NBDP is more robust compared to voice communication. However the difference has not been quantified in previous considerations of the possibility to phase out the NBDP carriage requirement, and the "real-life" benefit of having the possibility to "fall back" to NBDP seems unclear.

5.5 HF MSI is still needed in the modernized GMDSS, but can be accomplished by means other than NBDP. It is concluded that NBDP is not required to receive MSI and is not necessary to fulfil any of the other functional requirements.

5.6 ITU-R Recommendation M.1798-1 describes characteristics of HF radio equipment for the exchange of digital data and electronic mail in the maritime mobile service. This resource has not yet been put to use operationally and might be useful for ship-to-ship and ship-to-shore communication.

#### *Implications for the Modernization Plan*

5.7 It can be concluded that NBDP can be removed as a carriage requirement for distress follow-up communications in Sea Areas A3 and A4. Existing devices can be permitted to remain in use to receive MSI, if a ship is not equipped with other equipment suitable for the purpose.

5.8 Consider the future role for HF data exchange under ITU-R Recommendation M.1798-1.

## **6 NAVDAT**

6.1 WRC-12 established an exclusive primary allocation to the maritime mobile service in the band 495-505 kHz to fulfil possible requirements in the future, replacing the former Morse Code calling and distress allocation. NAVDAT is a digital broadcasting system designed to operate in the 495-505 kHz band using a multicarrier frequency modulation technique. It would coexist with the global system NAVTEX without mutual interference. The technology allows improved data rates with regard to the frequency band: rates up to 18 kbit/s are possible with NAVDAT, to compare to the 50 bit/s of NAVTEX<sup>2</sup>.

6.2 Purchasing NAVDAT or combined NAVDAT/NAVTEX receivers would be a cost to shipowners, but the quantity and type of information available, including graphical data could prove beneficial. Shipowners would be able to continue to use existing NAVTEX-only receivers for many years. MSI providers would need to install or have access to the required shore infrastructure to provide NAVDAT service.

6.3 If widely adopted, NAVDAT could replace NAVTEX sometime in the future.

#### *Implications for the Modernization Plan*

6.4 SOLAS chapter IV should be revised to allow ships to use NAVDAT service in addition to or in place of NAVTEX in places where NAVDAT is available.

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<sup>2</sup> See COMSAR 16/4/3 for a description of the digital system for broadcasting maritime safety and security-related information in the 500 kHz band (NAVDAT). Also: ITU-R Recommendation M.2010, characteristics of a digital system, named Navigational Data for broadcasting maritime safety and security related information from shore-to-ship in the 500 kHz band. ITU-R Recommendation M.2058-0, characteristics of a digital system named navigational data for broadcasting maritime safety and security related information from shore-to-ship in the maritime HF frequency band.

6.5 IMO and ITU should develop the necessary technical and operational recommendations and performance standards for international NAVDAT service. This work should be closely followed by the development of IEC standards for shipborne NAVDAT equipment.

6.6 The Modernization Plan should include development of NAVTEX/NAVDAT equipment standards for receiving all HF frequencies for MSI.

## **7 Shore-to-shore communications**

7.1 Shore-to-shore communications are not part of the GMDSS functional requirements, but are essential for the planning and coordination of search and rescue operations. In chapter I, it is clear that SOLAS is intended to apply to ships, even though obligations for Contracting Governments and Administrations may be stated or implied in some parts of SOLAS, as in regulations IV/5.1 and V/4 to V/13. Furthermore, shore-to-shore communications are not solely related to ship safety; they may be used in the case of aeronautical distress on or over ocean areas. However, the establishment of guidance for coastal radio stations (CRS) and the development of IEC standards would be useful.

7.2 SOLAS regulation V/7 includes obligations for Contracting Governments with respect to search and rescue services. A requirement could be added to regulation V/7 for the establishment of reliable shore-to-shore communications and a Maritime Rescue Co-ordination Centre (MRCC) or a Central Alerting Point (CAP) that is responsible for receiving distress alert information and responding as part of a SAR system. Regulation IV/5 (Undertakings by Contracting Governments) could be revised to ensure that it includes adequate responsibilities for governments to ensure adequate global distribution of coastal radio stations, adequate shore-based telecommunication infrastructure for SAR, and adequate staffing for shore-based facilities.

7.3 The establishment of requirements for the shore network is not included in the proposed modernization programme, noting that:

- .1 shore-to-shore communications are not included in the GMDSS functional requirements for ships and therefore could be considered outside the scope of GMDSS modernization;
- .2 the present distribution of coastal radio stations participating in the GMDSS is inconsistent; and
- .3 the establishment of new responsibilities for Contracting Governments would probably be controversial and potentially expensive, resulting in delay in the GMDSS modernization effort.

### *Implications for the Modernization Plan*

7.4 Guidance for CRS should be established through the development of IEC standards.

## **8 GMDSS equipment in SOLAS Chapter III**

8.1 SOLAS requirements for two-way VHF radiotelephone apparatus and search and rescue locating devices (originally Search and Rescue Transponders (SART)) were part of the 1983 SOLAS Amendments and placed in chapter III, which came into force in 1986 in advance of the GMDSS. However, these requirements form part of the GMDSS because they address some of the functional requirements and would be more naturally located in chapter IV.

*Implications for the Modernization Plan*

8.2 Except for communications equipment installed or always stowed in survival craft, the communications requirements for ships and life-saving appliances in chapter III, should be moved to chapter IV.

8.3 The "Record of Equipment" list in the certificates for these items will need to be appropriately amended.

## **9 Emergency devices for survival craft**

9.1 The ICAO/IMO Joint Working Group on SAR (JWG) (IMO/ITU EG 10/4/5) expressed the view that PLBs should be considered to be carried as radio equipment for life rafts and/or carried on persons. These would be helpful by enabling RCCs to locate and track every survival craft because survival craft may be drifting away from each other. However, the search and rescue locating devices required under current SOLAS regulation III/6.2.2 are intended for locating survival craft<sup>3</sup>. These devices can be either survival craft radar transponders (SART) operating with X-band radar, or AIS Search and Rescue Transmitters (AIS-SART).

9.2 PLBs are intended to be personal equipment and not for locating survival craft. They are similar to Cospas-Sarsat EPIRBs, but are small and compact because they do not necessarily have to float, and have about half of the battery lifetime of an EPIRB. Like EPIRBs, they typically include a 121.5 MHz homing device. A PLB can be coded in several ways, e.g. like an EPIRB. But PLBs may not be connected to the ship via the MMSI or other coding, and the battery operational life is also a matter of concern.

9.3 The search and rescue experts subsequently agreed that radar SARTs and AIS-SARTs were appropriate locating devices for survival craft and that PLBs were not necessarily appropriate in this regard.

9.4 Requirements for alerting and locating equipment are based on the concept that radio and/or EPIRBs will provide the alert and location of a vessel in distress. SARTs, pyrotechnic distress signals, highly visible colours for survival craft and flotation equipment, and locating lights are all intended to assist rescuers on-scene or close to the scene to locate survivors. 406 MHz equipment cannot be used for locating a survival craft by ships in the vicinity after a distress alert has been transmitted from the ship of origin. At present, the only shipborne system that could locate an EPIRB is a radio direction finder (not required) to detect a 121.5 MHz homing signal. If a survival craft on the open sea at night in harsh weather condition would need assistance by the nearest ships in the area, their means of locating the survival craft could be limited to receiving position information from shore.

9.5 Radar SARTs have been provided on ships since 1986, but SAR cases do not record many instances where they were of use. There may be several reasons. One is that with the exception of one free-fall lifeboat (if the ship is so-equipped), they are not carried on survival craft, but stowed in locations where they can be carried to survival craft. Only one or two are required to be carried on the ship, depending upon the size of the ship. As a result, it may be that they have not been put to use in many distress situations.

9.6 Radar SARTs should be able to be seen on X-band radars of ships responding to a distress, as well as maritime surveillance radars on SAR and military aircraft.

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<sup>3</sup> See also regulation IV/7.3

9.7 AIS-SART are relatively new devices, and are just beginning to be provided on ships, so their effectiveness has not yet been demonstrated in a SAR case, so far as is known. They are required in the same numbers as radar SARTs when they are used instead of radar SARTs. They should be visible on radar and other electronic chart screens such as ECDIS, equipped to display AIS targets. Likewise, they should be able to be seen on SAR and military aircraft equipped with AIS displays. In most cases, the range of detection of AIS-SARTs will be much greater than radar SARTs, especially from aircraft. However, older AIS receivers that have not been updated, will show AIS-SARTs as targets but will not display the "SART ACTIVE" text.

9.8 An advantage that an AIS-SART could have over the 121.5 MHz homer is that *with the appropriate display* on ships and aircraft, the position of the device will be shown. A direction finder for a 121.5 MHz signal will only indicate direction. Location will be indicated only when the indicated direction changes when an aircraft flies over the location. Furthermore, unless ships are equipped with 121.5 MHz direction finders (not required), they will not have any real-time information on the location of the survival craft. If the device is a PLB or something similar, the ship would have to rely on the position transmitted by or calculated from the 406 MHz signal relayed from Cospas-Sarsat. AIS-SARTs are more likely than 121.5 MHz homers to be detected by commercial as well as non-SOLAS ships. A new work item beginning in 2016 may result in a performance standard for EPIRBs that have both 121.5 MHz homing signals and AIS location.

9.9 A simple radio direction finder on certain ships would enable ships to locate distress or urgency radio transmissions in the VHF marine band and detect 121.5 MHz signals.

9.10 Location of survival craft might be improved by installing locating devices on survival craft, rather than just having a few stored on the ship to be carried to survival craft. This would not present a great problem for lifeboats, but might be more difficult for inflatable liferafts.

#### *Implications for the Modernization Plan*

9.11 Consider the development of a circular or other instrument to encourage Member Governments to adopt a requirement for certain categories of ships to carry VHF direction finders to detect 121.5 MHz signals and VHF marine band transmissions (for instance off shore industry vessels).

9.12 A decision needs to be made as to whether all lifeboats, and whether some or all inflatable liferafts should be equipped with installed locating devices. This would need to be coordinated with the SSE Sub-Committee and may be more appropriate as a requirement in chapter III of SOLAS, because this is where the lists of survival craft equipment are located.

## **10 Application of SOLAS chapter IV**

10.1 In discussions on the detailed review, some delegations were of the opinion that SOLAS chapter IV should be applicable to a wider group of ships, others preferred to maintain the current status, and to leave the application to non-SOLAS ships to national authorities. With some exceptions for regional solutions, the GMDSS forms the core of the distress and safety system for ships worldwide, which will apply to almost all ships regardless of the scope of SOLAS chapter IV. Contracting Governments have the ability to specify which components of the GMDSS apply to their non-SOLAS ships.

10.2 Although appropriate emergency devices are defined for SOLAS ships, most SAR operations are reported to involve more numerous non-SOLAS vessels. A lack of command of the English language and also illiteracy may cause problems for these vessels.



Nevertheless, ITU has only one system as laid down in the Radio Regulations, which is applicable to all vessels. Furthermore, non-SOLAS vessels may serve as rescue resources. The radar SART/AIS-SART devices are more likely to be detected by these vessels than 121.5 MHz homers.

*Implications for the Modernization Plan*

10.3 It is not practical to extend the scope of application of SOLAS chapter IV to ships beneath 300 gross tonnage. However, it is recognized that the integration and participation of non-SOLAS vessels in the Modernized GMDSS remains important. Decisions on and changes in the Modernized GMDSS should therefore be made in a way that non-SOLAS vessels are not excluded from participating in the Modernized GMDSS. There are no direct implications for the Modernization Plan. However, it must be ensured that new and revised IMO and ITU instruments do not exclude non-SOLAS vessels from participating in the GMDSS for technical or economic reasons, and that such instruments as affect non-SOLAS vessels are compatible with the GMDSS. Since the application of GMDSS to fishing vessels has been stipulated in the Cape Town Agreement, consideration may be given in the future to revise the Cape Town Agreement for consistency with the Modernized GMDSS.

**11 Standards for MOB devices to protect GMDSS integrity**

11.1 Concern was expressed about Man Overboard (MOB) Devices, in particular that they may use GMDSS distress frequencies for situations which are not actually distresses, and that regulations may be necessary to protect the integrity of the GMDSS.

11.2 ITU-R Report M.2285-0 provides an overview of MOB devices and their mode of operation. However, as a report it only reviews current (presumably acceptable) practices. Recent revisions to ITU-R Recommendation M.493 and ITU-R Recommendation M.541 establish an equipment class and operational standards for DSC MOB devices. The revised recommendations establish a more well-defined set of requirements for the technical performance and operational procedures for these devices.

11.3 The existence and use of MOB devices may have significant implications for users of the GMDSS. For instance, a SOLAS vessel receiving a signal from such a device will be obliged to report and investigate the situation – with all the economical and other consequences that may have. In particular devices making use of GMDSS frequencies and technology are of concern in this respect.

11.4 In addition to MOB devices, "alternative" uses of GMDSS frequencies and technology are already seen in the operational environment – e.g. use of AIS for all sorts of tracking purposes. All possible measures should be taken to avoid such non-safety uses of the system.

*Implications for the Modernization Plan*

11.5 Because new revisions of ITU-R Recommendations M.493 and M.541 have been published by ITU, and because MOB devices are not a required part of the GMDSS under SOLAS, there appears to be no direct implication as part of the Modernization Plan.

11.6 Because MOB devices and other equipment – existing or to be developed – may have significant implications for all parties to the GMDSS, it is important that the Modernized GMDSS is protected from abusing use of its frequencies and technologies. Measures to protect the integrity of the Modernized GMDSS should be investigated and implemented. One measure for consideration will be the agenda item for WRC-19 which is to consider regulatory actions within the frequency band 156-162.05 MHz for autonomous maritime radio devices to

protect the GMDSS and AIS. Another consideration could be a liaison statement to ITU-R indicating that because non-SOLAS ships make use of GMDSS, and that in order to protect the integrity of GMDSS, it is necessary that ITU-R recommendations on GMDSS systems and frequency use are prescriptive.

## 12 Reducing false alerts

12.1 Unintentional false alerts have been a concern in the GMDSS. These false alerts waste time and money for responders, so anything that can be reasonably done to reduce them would be beneficial. One source of false alerts has been significantly reduced and those are DSC automatic distress alert relays on MF and HF frequencies.

12.2 EPIRBs can be a source of false alerts. They are also designed to activate automatically when launched, and several things can happen which can cause them to begin transmitting unintentionally. This can happen without the ship's crew being aware of the problem because 406 MHz and 121.5 MHz EPIRB transmissions are not normally received on the ship.

12.3 Japan provided some statistics on false alerts. This data is for all ships including foreign-flag ships in the Japanese Search and Rescue Regions (SRR) in 2014:

	Number of alerts	Number of false alerts	Percentage of false alerts
EPIRB	503	484	96.2%
ELT	132	129	97.7%
PLB	10	10	100%

A survey found that most false alerts were the result of human error, and that mariner education is important. Failure to remove the battery when disposing of the beacon was another cause of false alerts. False alerts as a result of beacon failure rarely occurred.

12.4 The United States Sarsat Office looked at the percentage of false alerts as a function of the beacon population by type:

False alerts as a percentage of beacon population		Percentage of total beacons registered
EPIRB	0.91 %	47%
ELT	4.33 %	18%
PLB	0.38 %	35%
SSAS	4.69 %	-
Overall	1.25 %	

**Note:** SSAS is not part of the GMDSS

By this analysis, EPIRBs and PLBs are much less of a problem than aircraft Emergency Locator Transmitters (ELT). The number of SSAS beacons is small, and that result may not be significant. One way to view the EPIRB result is that an individual EPIRB can be expected to transmit a false alert once every 110 years.

12.5 One proposal was to provide an audible signal when the EPIRB begins to transmit.

12.6 Another proposal was to require a system that would include a 406 MHz receiver on the bridge. This would require a significant expenditure throughout the SOLAS fleet and was not thought to be cost-effective. The Maritime Safety Committee has declined to include the consideration of a related proposal in the biennial agenda of the NCSR Sub-Committee (MSC 95/22, paragraph 19.10).

12.7 It was noted that, although not currently part of the GMDSS modernization proposal, the suggestion for a simple radio direction finder on certain SOLAS ships would enable ships to locate distress or urgency radio transmissions in the marine band and detect 121.5 MHz signals (see paragraph 9.9). This would also allow for monitoring of ship's EPIRBs to detect unintentional activations. In this regard, the suggestion was supported to invite IMO to encourage its Member Governments to consider such a requirement for certain categories of ships (for instance offshore industry vessels).

#### *Implications for the Modernization Plan*

12.8 No specific action has been identified to reduce false alerts. Manufacturers should be made aware of the problem, perhaps through a circular recommending that they seek to reduce the susceptibility of their equipment to generating false alerts (note resolution A.814(19) on *Guidelines for the avoidance of false distress alerts*). It should also encourage reduction of false alerts caused by human error. Proper disposal should be emphasized, including removal of the battery. Measures should be taken to guide/educate people on how to handle EPIRBs in order to avoid misactivation, including sea fearers, operators, shipyards (both for building and recycling), inspectors and surveyors.

### **13 Coordination with the work on the implementation of the e-navigation Strategy Implementation Plan**

13.1 The GMDSS and other communication technologies are at the core of the e-navigation strategy, providing ship-to-shore and shore-to-ship exchange of data. AIS and ECDIS are the newest technologies included in SOLAS. AIS uses VHF maritime frequencies and ECDIS can indicate the position of the AIS signal on an electronic chart display. GMDSS satellite service providers will provide much of the communication capacity for e-navigation. VHF Data Exchange System (VDES) is another e-navigation technology in development that uses the VHF maritime frequencies. Furthermore, Digital Radio Mondial (DRM) has developed new capacity with digital transmission such as NAVDAT on MF.

13.2 Various e-navigation aspects considered included:

- .1 e-navigation gap analysis;
- .2 the need to integrate navigation systems and communication systems;
- .3 the need to read MSI in graphical display;
- .4 functionalities for shore-to-shore communications;
- .5 common shore-based system architecture (CSSA) for communications;
- .6 usability of equipment;
- .7 software quality assurance of equipment;
- .8 man-machine interface; and
- .9 the scalability to all types of vessels.

13.3 The GMDSS modernization project could be a framework to develop e-navigation communication by primarily securing in SOLAS the fundamental principles of communication for safeguarding human life at sea by the Contracting Governments.

13.4 The GMDSS modernization project could offer a possible common shore-based system architecture (CSSA) for communication by sharing for instance a Coastal Radio Station for different users: Rescue Co-ordination Centre (RCC), Maritime Assistance Service (MAS), Vessel Traffic Service (VTS), Maritime Safety Information (MSI) provider, Public Correspondence (PC).

*Implications for the Modernization Plan*

13.5 The GMDSS modernization project should support the e-navigation Strategy of IMO (MSC 85/26/Add 1, annex 20).

## **14 Role of VDES**

14.1 The VHF Data Exchange System (VDES) was developed by IALA to address emerging indications of overload of the AIS VHF Data Link (VDL) and simultaneously enabling a wider seamless data exchange for the maritime community. VDES is capable of exchanging Application Specific Messages (ASM), facilitating numerous applications for safety and security of navigation, protection of marine environment, efficiency of shipping and others. VDES will prospectively have a significant beneficial impact on the maritime information services including Aids to Navigation and VTS in the future. It can potentially provide local MSI.

14.2 The VDES concept includes a satellite component. This system component might be suitable to be used for the transmission of MSI information in remote areas.

14.3 The VDES concept is being developed under of Agenda Item 1.9 for WRC-19.

*Implications for the Modernization Plan*

14.4 The use of VDES needs to be considered in future possible mechanisms for the distribution of MSI.

## **15 Role of text messages, digital data, and/or distress chat via satellite**

15.1 Text messages and chat technologies are means of two-way communication, like voice and NBDP. Resolution A.1001(25) already addresses data communication systems. Under resolution A.1001(25), voice communication systems connect to the PSTN, and data communication systems connect to the public data communication network. Text messages and chat are data communication systems, so there may be no reason why they cannot be used for GMDSS communications. Safety-related messaging is also available through the AIS system.

*Implications for the Modernization Plan*

15.2 Consideration should be given to the possible SAR benefits of the inclusion of text messaging, digital data, and chat messaging capabilities.

15.3 Resolution A.1001(25) may need to be reviewed to investigate whether text messages, digital data, and chat can be included in GMDSS communications.

## **16 Other revisions to SOLAS chapter IV**

16.1 SOLAS chapter IV includes several provisions that are obsolete or, otherwise, in need of revision:

- .1 As decided under the High Level Review, "Security communications" and "Other communications" should be added to the functional requirements in addition to the GMDSS functions.
- .2 There are obsolete references to the International Radio Consultative Committee (CCIR).
- .3 Some terms and definitions are not consistent with the Radio Regulations and other ITU-R documents.
- .4 Regulation IV/6.2.5 refers to unspecified "other codes" to be clearly marked on the radio installation.
- .5 VHF EPIRBs have never been introduced.
- .6 Certain regulations, such as IV/9.1.2, should be simplified because separate DSC watch receivers are not common and modern equipment practice integrates the radio functions into a single installation.
- .7 Regulation IV/12.3 needs to be revised to reflect the decision to retain the VHF Channel 16 watch. A continuous listening watch is also needed in some areas for VTS, Maritime Assistance Service, coastal surveillance, ship reporting, port approaches etc.
- .8 Regulation IV/18 exempts communication equipment from automatically receiving the ship's position if the ship is not provided with a navigation receiver. Such receivers are now required on all ships under regulation V/19.2.1.6.

### *Implications for the Modernization Plan*

16.2 Definitions are needed for "Security communications" and "Other communications", as well as requirements for radio installations to perform these functions.

16.3 In accordance with the decisions of the High-Level Review, "Security communications" and "Other communications" need to be added to the functional requirements in chapter IV.

16.4 References to the International Radio Consultative Committee (CCIR) should be changed to the International Telecommunications Union (ITU-R).

16.5 Terms and definitions should be harmonized with the Radio Regulations and other ITU-R documents.

16.6 Regulation IV/6.2.5 should be revised to clarify the "other codes" required to be clearly marked on the radio installation.

16.7 The VHF EPIRB should be removed from SOLAS chapter IV.

16.8 Revise and simplify regulations, such as IV/9.1.2, to reflect that separate DSC watch receivers are no longer common and modern equipment practice integrates the radio functions into a single installation.

16.9 Revise regulation IV/12.3 to reflect the decision to retain the VHF Channel 16 watch, as well as continuous listening watches is also in some areas for general communications including VTS, Maritime Assistance Service, coastal surveillance, ship reporting, port approaches, etc.

16.10 Remove the regulation IV/18 exemption for communication equipment from automatically receiving the ship's position if the ship is not provided with a navigation receiver.

16.11 Review chapter IV for editorial improvements.

16.12 Review and revise IMO resolutions consequential to the decisions made for GMDSS modernization.

## **17 Outline of the Modernization Plan**

### *Revisions to SOLAS chapter III*

17.1 Except for communications equipment installed or always carried in survival craft, the communications requirements for ships and life-saving appliances in chapter III, should be moved to chapter IV (see paragraph 8.2).

17.2 A decision needs to be made as to whether all lifeboats, and whether some or all inflatable liferafts should be equipped with installed locating devices, and that requirement located in chapter III with other survival craft equipment (see paragraph 9.12).

17.3 The "Record of Equipment" list in the certificates for these items will need to be appropriately amended (see paragraph 8.3).

### *Revisions to SOLAS chapter IV*

17.4 The GMDSS modernization process should ensure that non-SOLAS vessels are not excluded from participating in the GMDSS for technical or economic reasons, and such instruments as affect non-SOLAS vessels should be compatible with the GMDSS (see paragraph 10.3).

17.5 The GMDSS modernization project needs to continue to support the needs of the e-navigation strategy (see paragraph 13.5).

17.6 SOLAS chapter IV should be revised to provide for other GMDSS satellite service providers in addition to Inmarsat (see paragraph 3.18).

17.7 NBDP can be removed as a required system, although existing devices can be permitted to remain in use to receive MSI, if a ship is not equipped with other equipment suitable for the purpose (see paragraph 5.7).

17.8 SOLAS chapter IV should be revised to allow NAVDAT service to be used in place of NAVTEX in places where NAVDAT is available (see paragraph 6.4).

17.9 Ship certificates will require definition of the geographical area in which the ship is permitted to sail with respect to Sea Areas A3 and A4. This can be accomplished by indicating the ship's GMDSS satellite service provider in brackets after the "A3", such as "A3 (Worldwidesat)" (see paragraph 3.13).

17.10 SOLAS regulations, including as a minimum IV/2, IV/10 and IV/11, will need to be revised to reflect the revised Sea Areas A3 and A4 (see paragraph 3.18).

17.11 Definitions are also needed for "Security communications" and "Other communications", as well as requirements for radio installations to perform these functions (see paragraph 16.2).

17.12 References to the International Radio Consultative Committee (CCIR) should be changed to the International Telecommunications Union (ITU-R) (see paragraph 16.4).

17.13 Terms and definitions should be harmonized with the Radio Regulations and other ITU-R documents (see paragraph 16.5).

17.14 "Security communications" and "Other communications" should be added to the functional requirements in addition to the GMDSS functions (see paragraph 16.3).

17.15 Regulation IV/6.2.5 should be revised to clarify the "other codes" required to be clearly marked on the radio installation (see paragraph 16.6).

17.16 The VHF EPIRB should be removed from SOLAS chapter IV (see paragraph 16.7).

17.17 Revise and simplify regulations, such as IV/9.1.2, to reflect that separate DSC watch receivers are no longer common and modern equipment practice integrates the radio functions into a single installation (see paragraph 16.8).

17.18 Revise regulation IV/12.3 to reflect the decision to retain the VHF Channel 16 watch, as well as continuous listening watches is also in some areas for general communications including VTS, Maritime Assistance Service, coastal surveillance, ship reporting, port approaches, etc. (see paragraph 16.9).

17.19 Remove the regulation IV/18 exemption for communication equipment from automatically receiving the ship's position if the ship is not provided with a navigation receiver (see paragraph 16.10).

17.20 Review chapter IV for editorial improvements (see paragraph 16.11).

#### *Other IMO Instruments*

17.21 Refer to the annex of this report.

17.22 No specific action has been identified to reduce false alerts. Manufacturers should be made aware of the problem, perhaps through a circular recommending that they seek to reduce the susceptibility of their equipment to generating false alerts. Note resolution A.814(19) on *Guidelines for the avoidance of false distress alerts*. It should also encourage reduction of false alerts caused by human error. Proper disposal should be emphasized, including removal of the battery. Measures should be taken to guide/educate people on how to handle EPIRBs in order to avoid misactivation, including sea fearers, operators, shipyards (both for building and recycling), inspectors and surveyors (see paragraph 12.8).

17.23 IMO and ITU should develop the necessary technical recommendations and performance standards for international NAVDAT service. This work should be closely followed by the development of IMO and IEC standards for shipborne NAVDAT and/or combined NAVTEX/NAVDAT equipment (see paragraphs 5.7 and 6.4).

17.24 Consider the development of a circular or other instrument to encourage Member Governments to adopt a requirement for certain categories of ships to carry VHF direction finders to detect 121.5 MHz signals and VHF marine band transmissions (for instance off shore industry vessels) (see paragraph 9.11).

17.25 Consideration should be given to the possible SAR benefits of the inclusion of text messaging, digital data, and chat messaging capabilities (see paragraph 15.2).

17.26 Mariner training will be affected and amendments to STCW including Model Courses may be required. Model Courses will in general need to be revised to reflect the new Sea Area A3 definition and its effect on Sea Area A4, together with other amendments to chapter IV. Mariner training will be affected and amendments to STCW may be required (see paragraphs 3.11 and 3.23).

17.27 New and revised IMO instruments should not exclude non-SOLAS vessels from participating in the GMDSS for technical or economic reasons, and such instruments as affect non-SOLAS vessels should be compatible with the GMDSS (see paragraph 10.3).

17.28 The technical basis for determining the minimum number of HF GMDSS coast stations and their geographical distribution should be reviewed and, if necessary, consequential changes should be included in resolution A.801(19) (see paragraphs 0 and also 17.34 regarding guidance for CRS).

#### *ITU Reports and Resolutions*

17.29 IMO and ITU should develop the necessary technical and operational recommendations and performance standards for international NAVDAT service (see paragraph 6.5).

17.30 Consideration should be given to a liaison statement to ITU-R indicating that it is desirable that non-SOLAS ships make use of the GMDSS, and that in order to protect the integrity of the GMDSS, it is necessary that ITU-R recommendations on GMDSS systems and frequency use are prescriptive (see paragraph 11.6).

17.31 New and revised ITU instruments should not exclude non-SOLAS vessels from participating in the GMDSS for technical or economic reasons, and such instruments as affect non-SOLAS vessels should be compatible with the GMDSS (see paragraph 10.3).

17.32 Consider the future role for HF data exchange under ITU-R Recommendation 1798-1 (see paragraph 0).

#### *IEC Standards*

17.33 Completion of IMO and ITU technical and operational recommendations and performance standards for international NAVDAT service, should be followed by the development of IEC standards for shipborne NAVDAT equipment (see paragraph 6.5).

17.34 Guidance for coastal radio stations (CRS) should be established through the development of IEC standards (see paragraph 7.4).

#### *Provision of GMDSS satellite services*

17.35 Formatting of EGC should be standardized if possible to minimize delays, and if possible, a way should be found to transmit EGC simultaneously on all GMDSS satellite service providers (see paragraph 2.19).



*MSI providers*

17.36 Possible ways for MSI providers to provide and monitor MSI broadcasts over multiple GMDSS satellite service providers should be identified with a view to minimizing the costs, or at least the cost increases for MSI providers. Resolution A.707(17) could be revised to provide for shore-to-ship MSI broadcasts without charge to the originator (see paragraph 2.18).

17.37 Determine whether it is possible and feasible to retain the current requirement to be able to receive MSI using EGC (SOLAS regulation IV/7.1.5), taking into account the new definition of Sea Area A3 and the inclusion of new satellite providers in the GMDSS (see paragraph 3.19).

17.38 Depending on conclusions under paragraph 17.37, determine whether changes are required to the availability HF-MSI in certain areas as a consequence of the new definition of Sea Area A3 and the inclusion of new satellite providers in the GMDSS (see paragraph 3.20).

17.39 The use of VDES needs to be considered in future possible mechanisms for the distribution of MSI (see paragraph 14.4).

*HF communications*

17.40 Technological improvements can make HF easier to use. Consider revising resolutions A.806(19) and MSC.68(68), annex 3, to include a requirement for frequency scanning and/or ALE (see paragraphs 4.13 and 4.14).

*Transitional provisions*

17.41 Administrations, port State control authorities, and classification societies need to be informed of the change to Sea Area A3/A4, and a suitable transition period needs to be identified for certificates (see paragraph 3.24).

ANNEX

**Preliminary list of IMO instruments relevant to the GMDSS which may need to be reviewed for GMDSS modernization**

<b>2015</b>		<b>Notes</b>
GMDSS.1/Circ.17 (or current edition)	GMDSS Master Plan	<ul style="list-style-type: none"> <li>• Update lists of shore-based facilities and coast stations.</li> <li>• Revise or reorganize for new Sea Areas A3 and A4.</li> <li>• Make provision for any additional satellite service providers and revise any Inmarsat-specific terms.</li> <li>• Include NAVDAT service areas, if available.</li> <li>• Revise sections referring to NBDP, if NBDP service is discontinued.</li> <li>• Include maps of recognized satellite service provider coverage areas.</li> </ul>
<b>2013</b>	Title	
MSC.1/Circ.1287/Rev.1	Promulgation of maritime safety information	<ul style="list-style-type: none"> <li>• Make provision for any additional satellite service providers and revise any Inmarsat-specific terms such as SafetyNET.</li> <li>• Include NAVDAT service, if available.</li> <li>• Revise sections referring to NBDP, if NBDP service is discontinued.</li> </ul>
<b>2012</b>		
Resolution MSC.347(91)	Recommendation for the protection of the AIS VHF data link	<ul style="list-style-type: none"> <li>• Update AIS radio channels</li> </ul>
MSC.1/Circ.1414	Guidance to prospective GMDSS satellite service providers	<ul style="list-style-type: none"> <li>• Change "COMSAR" references to "NCSR"</li> <li>• Refers to "nine" GMDSS functions – now ten</li> </ul>

MSC/Circ.1040/Rev.1	Guidelines on annual testing of 406 MHz satellite EPIRBs	<ul style="list-style-type: none"> <li>• Ensure guidelines are relevant for Second Generation Beacons</li> <li>• Provide for EPIRBs with AIS locators</li> </ul>
COMSAR.1/Circ.50/Rev.3	Distress priority communications for RCC from shore-to-ship via Inmarsat	<ul style="list-style-type: none"> <li>• Consider whether similar circular is needed for additional satellite providers</li> </ul>
<b>2011</b>		
Res. A.1051(27)	IMO/WMO Worldwide Met-Ocean Information and Warning Service – Guidance Document	<ul style="list-style-type: none"> <li>• Make provision for any additional satellite service providers and revise any Inmarsat-specific terms such as SafetyNET</li> </ul>
MSC.1/Circ.1403	Revised NAVTEX manual	<ul style="list-style-type: none"> <li>• Make provision for any additional satellite service providers and revise any Inmarsat-specific terms such as SafetyNET.</li> <li>• Include NAVDAT service, if available.</li> <li>• Revise sections referring to NBDP, if NBDP service is discontinued.</li> </ul>
<b>2010</b>		
Resolution MSC.306(87)	Revised performance standards for Enhanced Group Call (EGC) equipment	<ul style="list-style-type: none"> <li>• Make provision for any additional satellite service providers, if necessary.</li> </ul>
MSC.1/Circ.1364	Revised International SafetyNet Manual	<ul style="list-style-type: none"> <li>• Sea Area definition and consequential changes</li> <li>• Make provision for any additional satellite service providers and revise any Inmarsat-specific terms such as SafetyNET. - OR -</li> <li>• Develop parallel manual for any new satellite service providers.</li> </ul>

<b>2009</b>		
Res.A.1021(26)	Code on alerts and indicators	<ul style="list-style-type: none"> <li>• Review to determine if alerts generated by communication systems should be included.</li> <li>• Any new or revised instruments should be consistent with this code.</li> </ul>
<b>2007</b>		
Resolution A.1001(25)	Criteria for the provision of mobile satellite communication systems in the global maritime distress and safety system (GMDSS)	<ul style="list-style-type: none"> <li>• Description of functional requirements will need revision</li> <li>• Investigate whether text messages, digital data, and chat can be included.</li> </ul>
COMSAR.1/Circ.41	Analysis of MSI promulgated via the EGC SafetyNet system and recommendations on improving its quality	<ul style="list-style-type: none"> <li>• Make provision for any additional satellite service providers and revise any Inmarsat-specific terms such as SafetyNET. - OR -</li> <li>• Develop parallel manual for any new satellite service providers.</li> </ul>
<b>2005</b>		
COMSAR.1/Circ.36	Broadcast of warnings for tsunamis and other natural disasters	<ul style="list-style-type: none"> <li>• Make provision for any additional satellite service providers and revise any Inmarsat-specific terms such as SafetyNET. - OR -</li> <li>• Develop parallel manual for any new satellite service providers.</li> </ul>
COMSAR/Circ.37	Guidance on minimum communication needs of Maritime Rescue Co-ordination Centres (MRCCs)	<ul style="list-style-type: none"> <li>• Make provision for any additional satellite service providers and revise any Inmarsat-specific terms such as SafetyNET.</li> <li>• Review section on Telex link – is it used?</li> </ul>

<b>2004</b>		
COMSAR/Circ.32	Harmonization of GMDSS requirements for radio installations on board SOLAS ships	<ul style="list-style-type: none"> <li>• Some terms need revision, <i>i.e.</i> "radar transponder"; "A3" and "A4" will have different meanings</li> <li>• Update channel 16 watch requirements</li> <li>• Is description of radio work station consistent with current bridge design?</li> <li>• Make provision for any additional satellite service providers</li> </ul>
<b>2003</b>		
Resolution MSC.149(77)	Adoption of the revised performance standards for survival craft portable two-way VHF radiotelephone apparatus	<ul style="list-style-type: none"> <li>• May need to be revised depending upon decision on aeronautical frequencies.</li> </ul>
<b>2002</b>		
Resolution MSC.131(75)	Maintenance of a continuous listening watch on VHF channel 16 by SOLAS ships whilst at sea and installation of VHF DSC facilities on non-SOLAS ships	<ul style="list-style-type: none"> <li>• Revoke or revise. (Note that the resolution encourages use of VHF DSC and does not reflect decision on continued channel 16 watch. A new resolution may be needed to contain the elements that are still relevant and of importance)</li> </ul>
Resolution MSC.130(75)	Performance standards for Inmarsat ship earth stations capable of two-way communications	<ul style="list-style-type: none"> <li>• Make provision for any additional satellite service providers. - OR -</li> <li>• Develop parallel resolution for any new satellite service providers.</li> </ul>
MSC/Circ.1038	Guidelines for general radiocommunications	<ul style="list-style-type: none"> <li>• Requires revision with respect to "general communications"</li> </ul>
MSC/Circ.1039	Guidelines for shore-based maintenance of satellite EPIRBs	<ul style="list-style-type: none"> <li>• Revise to include AIS locators</li> <li>• Delete L-band EPIRB</li> <li>• Review for needed changes in respect of Second Generation Beacons</li> </ul>

<b>1998</b>		
COMSAR/Circ.17	Recommendation on use of GMDSS equipment for non-safety communications	<ul style="list-style-type: none"> <li>Consider including in a revision of MSC/Circ.1038</li> </ul>
<b>1997</b>		
MSC/Circ.803	Participation of non-SOLAS ships in the GMDSS	<ul style="list-style-type: none"> <li>Should be reviewed and generally updated (reference to 2182 kHz alarm signal which has been removed in COLREG by Resolution A.1004(25)/Rev.1).</li> </ul>
<b>1995</b>		
Resolution A.811(19)	Performance standards for a shipborne integrated radiocommunication system (IRCS) when used in the GMDSS	<ul style="list-style-type: none"> <li>(Note current IEC project on IRCS)</li> </ul>
Resolution A.802(19) as amended by resolution MSC.247(83)	Performance standards for survival craft radar transponders for use in search and rescue operations	<ul style="list-style-type: none"> <li>Should be reviewed and updated at least with respect to ITU-R M.628-5</li> </ul>
Resolution A.801(19), as amended by MSC.199(80)	Provision of radio services for the global maritime distress and safety system, (GMDSS)	<ul style="list-style-type: none"> <li>Will need to be revised in respect of new A3 and A4 Sea Areas</li> </ul>
Resolution A.804(19), as amended by resolution MSC.68(68), annex 2	Performance standards for shipborne MF radio installations capable of voice communication and digital selective calling	<ul style="list-style-type: none"> <li>Will need to be revised to include additional satellite service providers</li> <li>May need to be revised with respect to decisions on NBDP</li> </ul>
Resolution A.803(19), as amended by resolution MSC.68(68), annex 1	Performance standards for shipborne VHF radio installations capable of voice communications and digital selective calling	<ul style="list-style-type: none"> <li>May need to be revised with respect to ITU-R M.493-14</li> </ul>
Resolution A.805(19)	Performance standards for float-free VHF emergency position-indicating radio beacons	<ul style="list-style-type: none"> <li>To be suppressed</li> </ul>
Resolution A.806(19), as amended by resolution MSC.68(68), annex 3	Performance standards for shipborne MF/HF radio installations capable of voice communications and digital selective calling	<ul style="list-style-type: none"> <li>May need to be revised with respect to decisions on NBDP</li> <li>Consider requirement for ALE</li> </ul>
Resolution A.807(19), as amended by resolution MSC.68(68), annex 4	Performance standards for Inmarsat-C ship earth station capable of transmitting and receiving direct-printing communications	

Resolution A.808(19)	Performance standards for ship earth stations capable of two-way communications	<ul style="list-style-type: none"> <li>• Will need to be revised to include additional satellite service providers</li> </ul>
Resolution A.810(19), as amended by resolutions MSC.56(66) and MSC.120(74)	Performance standards for float-free satellite emergency position-indicating beacons operating on 406 MHz	<ul style="list-style-type: none"> <li>• On NCSR 3 agenda for revision</li> </ul>
<b>1994</b>		
COM/Circ.117	Clarifications of the application of certain provisions of chapter IV of the SOLAS Convention	<ul style="list-style-type: none"> <li>• Should be able to be revoked after adoption of revised chapter IV</li> </ul>
<b>1993</b>		
Resolution A.763(18), as amended by resolution A.810 (19), as amended by resolutions MSC.56(66) and 120(74)	Performance standards for float-free satellite emergency position-indicating radio beacons (EPIRBs) operating on 406 MHz	<ul style="list-style-type: none"> <li>• No change - Does not apply to EPRIBs installed on or after 23 November 1996</li> </ul>
Resolution A.762(18), as amended by resolution A.809 (19), as revised by resolution MSC.149(77)	Performance standards for survival craft two-way VHF radiotelephone apparatus	<ul style="list-style-type: none"> <li>• No change – Does not apply to VHF radiotelephone apparatus installed on or after 23 November 1996</li> </ul>
COM/Circ.110 + Corr.1	Clarifications of SOLAS regulations IV/6.1, IV/6.2.2 and IV/10.1.1.3	<ul style="list-style-type: none"> <li>• Should be able to be revoked after adoption of revised chapter IV</li> </ul>
<b>1991</b>		
Resolution A.707(17)	Charges for Distress, Urgency and Safety Messages through the Inmarsat System	<ul style="list-style-type: none"> <li>• Revise for additional satellite service providers</li> <li>• Consider provision of shore-to-ship MSI broadcasts without charge to the originator.</li> </ul>
Resolution A.702(17)	Radio maintenance guidelines for the global maritime distress and safety system (GMDSS) related to sea areas A3 and A4	<ul style="list-style-type: none"> <li>• References to Sea Areas and Inmarsat need to be revised</li> </ul>
Resolution A.700(17)	Performance standards for narrow-band direct-printing telegraph equipment for the reception of navigational and meteorological warnings and urgent information to ships (MSI) by HF	<ul style="list-style-type: none"> <li>• May need to be revised with respect to decisions on NBDP</li> </ul>

Resolution A.699(17)	System performance standard for the promulgation and co-ordination of maritime safety information using high-frequency narrow-band direct-printing	<ul style="list-style-type: none"> <li>• May need to be revised with respect to decisions on NBDP</li> </ul>
Resolution A.698(17), as amended by resolutions A.808(19) and MSC.149(77)	Performance standards for ship earth stations capable of two-way communications	<ul style="list-style-type: none"> <li>• No change – Does not apply to stations installed on or after 23 November 1996</li> </ul>
Resolution A.696(17)	Type approval of satellite emergency position-indicating radio beacons (EPIRBs) operating in the COSPAS-SARSAT system	<ul style="list-style-type: none"> <li>• Should be revised after adoption of revision of resolution A.810 (19)</li> </ul>
Resolution A.694(17)	General requirements for shipborne radio equipment forming part of the global maritime distress and safety system (GMDSS) and for electronic navigational aids	(On the postbiennial agenda of the Committee for revision)
COM/Circ.105 + Corr.1	Clarification of certain provisions of the 1998 SOLAS amendments for the GMDSS	<ul style="list-style-type: none"> <li>• Should be able to be revoked after adoption of revised chapter IV</li> </ul>
<b>1989</b>		
Resolution A.663(16), as amended by resolutions A.807(19) and MSC.68(68)	Performance standards for INMARSAT Standard-C ship earth stations capable of transmitting and receiving direct-printing communications	<ul style="list-style-type: none"> <li>• No change – Does not apply to stations installed on or after 23 November 1996</li> </ul>
<b>1987</b>		
Resolution A.617(15)	Implementation of the NAVTEX system as a component of the world-wide navigational warning service	<ul style="list-style-type: none"> <li>• Consider for revocation – may have been overtaken by more recent instruments, e.g. NAVTEX Manual</li> </ul>
Resolution A.616(15)	Search and rescue homing capability	<ul style="list-style-type: none"> <li>• Needs to be revised to provide for possibility of AIS location from ship and EPIRB transmitters</li> </ul>
Resolution A.613(15), as amended by resolutions A.806(19) and MSC.68(68)	Performance standards for shipborne MF/HF radio installations capable of voice communication, narrow-band direct-printing and digital selective calling	<ul style="list-style-type: none"> <li>• No change – Does not apply to equipment installed on or after 23 November 1996</li> </ul>
Resolution A.612(15), as amended by resolution A.805(19)	Performance standards for float-free VHF emergency position-indicating radio beacons	<ul style="list-style-type: none"> <li>• To be suppressed</li> </ul>
Resolution A.610(15), as amended by resolutions A.804(19) and MSC.68(68)	Performance standards for shipborne MF radio installations capable of voice communication and digital selective calling	<ul style="list-style-type: none"> <li>• No change - Does not apply to equipment installed on or after 23 November 1996</li> </ul>



Resolution A.609(15), as amended by resolutions A.803(19) and MSC.68(68)	Performance standards for shipborne VHF radio installations capable of voice communication and digital selective calling	<ul style="list-style-type: none"> <li>• No change – Does not apply to equipment installed on or after 23 November 1996</li> </ul>
<b>1985</b>		
Resolution A.570(14)	Type approval of ship earth stations	<ul style="list-style-type: none"> <li>• Make provision for any additional satellite service providers.</li> </ul>
<b>1983</b>		
Resolution A.525(13)	Performance standards for narrow-band direct-printing telegraph equipment for the reception of navigational and meteorological warnings and urgent information to ships	<ul style="list-style-type: none"> <li>• No change - Does not apply to equipment installed on or after 1 July 2005</li> </ul>

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## ANNEX 2

### ELEMENTS CONSIDERED DURING THE DETAILED REVIEW AND THEIR DISPOSITION

1 During discussions on the Detailed Review of the GMDSS, a number of possible changes were considered. This annex identifies the subjects that were considered and determined not to be included in GMDSS modernization.

#### Watches

2 A proposal was made to include the same kind of regulation in SOLAS regulation IV/12 as was currently included in the Radio Regulations on the actions ships should take when learning that another ship was in distress. After some discussion, the group agreed to not duplicate the provision of the Radio Regulations into SOLAS (Ref: NCSR 2/13, paragraph 51).

#### On-air test features

3 There were no particular ideas set forth on which on-air test features could or should be introduced at shore stations. In this regard, it was noted that test calls on HF radio were in many cases not answered. It was agreed that this was an issue of concern, but that this was not something new to be introduced but was related to the current status of the HF network. The group concluded that no additional work on this matter was required (Ref: NCSR 2/13, paragraph 58).

#### Aviation frequencies to provide for two-way on-scene communications

4 The ICAO/IMO Joint Working Group on SAR (JWG) that it would be beneficial if all ships were to be required to be able to operate on aviation frequencies, noting that passenger ships in SOLAS are already required to provide for two-way on-scene communications on 121.5 MHz and 123.1 MHz (regulation IV/7.2). It was decided that the use of such communications would only be required in rare circumstances and there might be other ways, for instance MF/HF radio, to enable contact between ships and aircraft, and therefore would not be cost-effective. It was concluded that much more consideration was needed and some support was expressed to further study such a requirement for Sea Areas A3 and A4 (Ref: IMO/ITU EG 10/4/5 and NCSR 2/13, paragraphs 60 to 63).

#### Other proposals

5 Other proposals were made during the detailed review, which were noted or discussed briefly but not carried forward. These include:

- .1 Ability to play back voice messages (Ref: COMSAR 15/INF.3, table, row 7).
- .2 Use of AIS for SAR communications (Ref: COMSAR 16/7/1 and COMSAR 16/7/3).
- .3 Use of text to supplement voice for traffic management and SAR (Ref: COMSAR 15/INF.3, paragraph 6 and table, row 7).
- .4 Ship reporting functions to support SAR (COMSAR 15/11, annex paragraph 30.3).

- .5 Method to communicate digital data between SAR and ship (COMSAR 16/11, annex 1, 310-Gte01-Ste02).
- .6 Modernization of GMDSS into digital communication – IP technology (COMSAR 16/11, annex 1, 120-Gte04-Ste01, 220-Gte01-Ste01).
- .7 Improve NAVTEX bandwidth. Provide MSI as a ship-"pull" service (COMSAR 15/INF.4, paragraph 17).
- .8 New technology to provide automatic connection to the switched telephone network (NCSR 1/13, annex, paragraph 9.2.2).
- .9 FAL forms and Maritime Service Portfolios (COMSAR 16/11, paragraphs 36 to 45).
- .10 Automatic ship reporting (COMSAR 16/11, annex 1, 140-Gte01 to 05, 140-Gop01/02, 140-Gtr01).
- .11 Improve pilot-mariner communication (COMSAR 16/11, annex 1, 135-Gte03).
- .12 Automatically detect free/open working channels (COMSAR 15/INF.3, paragraph 7, table, row 2).
- .13 Easier identification of addressees – link with AIS? (COMSAR 15/INF.3, table, row 1).
- .14 Problems with simplex use of channels (COMSAR 14/4 (34)).
- .15 Improve human-machine interface:  
(COMSAR 16/9/2)  
(COMSAR 16/11, annex 1, 134-Gte01-Ste01/02)  
(COMSAR 16/11, annex 1, 134-Gte01-Sre01/05)  
(COMSAR 16/11, annex 1, 134-Gte01-Sre02/04)  
(COMSAR 16/11, annex 1, 134-Gre03)  
(COMSAR 16/11, annex 1, 134-Gre04)  
(COMSAR 16/11, annex 1, 134-Gop01)  
(COMSAR 15/3/10, paragraphs 4.1 and 6.3)  
(COMSAR 15/INF.3, paragraphs 2 and 3, and table, rows 4 and 8)  
(COMSAR 14/7)