

Appendix 2 to the report of the 11th meeting of the Joint IMO/ITU Experts Group (5 to 9 October 2015)

DISCUSSION DOCUMENT

**Review and Modernization of the GMDSS -
Preliminary Draft Outcome of the Detailed Review of the
Global Maritime Distress and Safety System (GMDSS)**

Introduction	Comments, including information from other input documents to this meeting
<p>1 The Global Maritime Distress and Safety System 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.</p>	<p><u>Requirement to add description of Non SOLAS vessel. Non SOLAS vessels are vessels that do not fall within the scope of SOLAS IV/1.</u></p>
<p>2 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 Communication, 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. 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.</p>	
<p>3 This Detailed Review took place from 2013 to 2016. It builds on the outcome of the High Level Review and sets the agenda for the Modernization Plan. As a result of the Detailed Review, no new carriage or retrofit requirements for ships are being proposed. Some equipment will evolve over time to use newer technologies. <u>[Noting that consequential updates of equipment based on decisions of future competent ITU World Radiocommunication Conference may be necessary.]</u></p>	<p><u>-To be reviewed after having gone through all document.</u></p>

Additional satellite systems in the GMDSS	
<p>4 Inmarsat has been the sole provider of satellite communication services in the GMDSS 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.</p>	
Interoperability	
<p>4.1 Concerns were expressed about interoperability, referring to <u>the ability to conduct ship-to-ship, ship-to-shore, and shore-to-ship communications without regard to differing [satellite] [communication] systems in use by the communicating stations</u>. 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. Adoption of A.1001(25) was at least also an acceptance of that more system providers would inevitably result in increased system complexity. 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 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 regulation IV/10.1.2 and 10.7.</p>	<p>it was highly desirable that a RCC should be able to make broadcasts to a number of ships simultaneously, without having to go through different satellite service providers or use separate system interfaces (11/4/2 – 7.8.7)</p> <p>supported, therefore, in view of .1 above, as a possible solution, the idea brought forward by France (WP.23) to transfer EGC messages through one 'single point of distribution' (11/4/2 – 7.8.7)</p> <p>noted that there was in principle no requirement to install a Ship Earth Station (SES) at RCCs, although in some countries, where there was no robust PSTN available there needed to be a solution to back up the land infrastructure (11/4/2 – 7.8.7)</p> <p>The alerting and relay procedure to be carried out via two or more satellite provider will need a more in depth discussion, especially when taking into account that the vessels in the related area and there Satellite equipment are not known to the MRCC. (11/4/7)</p>

4.2	However, NAVAREA coordinators, Sub-Area coordinators and national coordinators under resolution A.707(17), and METAREA coordinators and issuing services under resolution A.1051(27), are required to <u>monitor</u> their broadcasts to ensure that the messages have been correctly transmitted. These requirements are typically met by having the relevant satellite terminals.	
4.3	Maritime Rescue Coordination Centres (MRCC) 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.	the term MRCC was not preferred, but that the generic term RCC should be used in new and amended material, including SOLAS; (11/4/2 – 7.8.7)
4.4	Other concerns were raised on using the PSTN for prioritized distress communications. 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 Maritime Search and Rescue Centre (MRCC). Dedicated communication lines or other high availability and reliability connections may be necessary for the shore based network.	the term MRCC was not preferred, but that the generic term RCC should be used in new and amended material, including SOLAS; (11/4/2 – 7.8.7)
<i>Cost implications</i>		
4.5	Inmarsat charging policies are covered in Resolution A.707(17), which recommends that coast earth stations not be charged for:	
	<ul style="list-style-type: none"> - ship-to-shore and shore-to-ship distress traffic; - urgent ship-to-shore navigational and meteorological danger reports using record and communications; - medical assistance for persons in grave and imminent danger. 	
4.6	Furthermore, resolution A.707(17) recommends that ships not be charged for:	
	<ul style="list-style-type: none"> - meteorological reports; - ship position reports; and 	

	- medical advice and assistance messages other than those referred to in paragraph Error! Reference source not found.	
4.7	These same charging policies should apply to any new GMDSS satellite service provider.	
4.8	Coast earth 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 Error! Reference source not found. and Error! Reference source not found. . 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.	
4.9	Cost implications for SAR authorities should not change since they should not be charged for distress traffic. They should also not have to install additional coast earth <u>land</u> stations, since they will be able to communicate with ships served by new GMDSS satellite service providers, using existing hardware and systems since they should all be interoperable. However, they may find that it is more efficient to have their own coast earth <u>land</u> station for each GMDSS satellite service provider.	<u>More work to be done.</u>
4.10	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. Since 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. The simplest A solution to the problem would be to add MSI broadcasts to Resolution A.707(17) list that coast earth stations <u>MSI providers</u> are not charged for (see Error! Reference source not found.). 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. <u>Any change to charging policy should be done in the context considering the overall service requirement.</u>	<u>More work to be done.</u>
4.11	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.	
	<i>Frequency coordination</i>	
4.12	Concern was expressed regarding frequency coordination. This should not <u>lead to any change to be a concern for</u> the GMDSS Modernization Program <u>under IMO</u> , since the coordination should be carried out <u>in accordance with the relevant procedures of the Radio Regulations by ITU</u> .	<u>The text to be improved.</u>
	<i>ITU List V and MARS Database</i>	
4.13	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”.	
4.14	When records in the MARS database are examined, it is apparent that some ship listings include their Inmarsat identities, and others do not.	
4.15	Resolution A.887(21) should be revised to apply to all GMDSS satellite service providers. It should also be clarified as to whether or not satellite service provider identities should be included in databases such as List V and MARS, or whether registration with the satellite service provider is sufficient, especially for SAR purposes.	
	<i>Implications for the Modernization Plan</i>	
4.16	SOLAS Chapter IV should be revised to provide for other GMDSS satellite service providers in addition to Inmarsat.	
4.17	Consideration should be given to <u>requiring-achieving</u> dedicated communication lines or other high availability and reliability connections for certain parts of the shore based network.	

4.18	Possible ways for MSI providers to provide and monitor MSI broadcasts over multiple GMDSS satellite service providers should be identified. <u>In addition</u> , 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.	
4.19	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.	
4.20	Resolution A.887(21) should be clarified as to <u>ensure that -whether or not</u> satellite service provider identities should be included in <u>a</u> databases, such as List V <u>included in</u> and MARS, <u>or whether registration with the satellite service provider is sufficient, especially for SAR purposes.</u>	agreed that the registration of ship borne terminals identities with the satellite service provider would be sufficient, if all necessary information as set out in resolution A.887(21) would be included in the database of the satellite service provider and database would be available to RCCs H24. In these cases there might be no need to also include these identities in databases such as ITUs List V and MARS (11/4/2 – 7.8.7)
4.21	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.	
Redefinition of Sea Area A3		
5	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.		
6	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 since 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.	
<i>HF carriage requirements</i>	
<p>6.1 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 <u>and as a secondary means of alerting</u>. It will now be operating in Sea Area A4 which is no longer just polar regions.</p>	<p>It should be noted that as second alerting option HF might be a possible solution also for ships fitted with a recognized satellite system. (11/4/7)</p>
<i>Promulgation of MSI by HF</i>	
<p>6.2 Since 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.</p>	
<p>6.3 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.</p>	
<p>6.4 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.</p>	
<p>6.5 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</p>	

	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 Error! Reference source not found. and Error! Reference source not found.)	
	<i>Transitional arrangements</i>	
6.6	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).	
	<i>Obligations for shore authorities provision of services and implications for SAR</i>	
6.7	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.	
	<i>Implications for the GMDSS Master Plan</i>	
6.8	The GMDSS Master Plan (currently GMDSS.1/Circ.17) will need to be revised and possibly reorganized since it lists stations that operate in the various Sea Areas.	
	<i>Implications for amendments to Model Courses</i>	
6.9	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.	
	<i>Implications for non-SOLAS vessels</i>	

<p>6.10 <u>Non SOLAS vessels are vessels that do not fall within the scope of SOLAS IV/1. The redefinition of SOLAS Sea Area 3 should not affect <u>vessels to which regulation SOLAS IV/1 do not apply</u> non-SOLAS vessels.</u></p>	<p>The term “non-SOLAS” is an easy ‘note’ but behind this term many different types of vessels are hidden, to identify the implication to certain vessels a detailed list need to be discussed. e.g. Fisherboats operated close to coast – most are in A1 Trawler – high sea - depend on the area of operation State owned ships - depend on the area of operation Yachts - most of the operate in A1 (11/4/7)</p>
<p><i>Effects on ship's certificates (NCSR 2/9/Rev.1, paragraphs 6.3 and 6.4)</i></p>	
<p>6.11 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)”.</p>	
<p>6.12 Alternatively, a geographical presentation could be added 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 Error! Reference source not found. and is not recommended.</p>	
<p>6.13 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.</p>	
<p>6.14 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.</p>	
<p><i>Satellite equipment carriage options</i></p>	

6.15	As with Inmarsat, ships will need to carry satellite terminals approved to work with their selected service provider.	
<i>Implications for the Modernization Plan</i>		
6.16	SOLAS regulations including as a minimum IV/2, IV/11 and IV/12 will need to be revised to reflect the revised Sea Areas A3 and A4.	
6.17	<u>Determine whether it is possible and feasible to retain the current requirement to be able to receive MSI using EGC (SOLAS IV/7.1.5), taking into account the new definition of Sea Area A3 and the inclusion of new satellite providers in the GMDSS.</u>	<u>The improved text is expected from Denmark.</u>
6.18	<u>Depending on conclusions under 6.17 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.</u>	
6.19	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.	
6.20	The GMDSS Master Plan (currently GMDSS.1/Circ.17) will need to be revised and possibly reorganized <u>and will need to include the service areas for the GMDSS satellite providers.</u>	
6.21	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.	
6.22	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.	

The role of MF/HF	
<p>7 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 are <u>at present required</u> also now required in Sea Area A3 even when the ship has Inmarsat GMDSS satellite service. This provides a ship-to-ship communications option when one of the communicating ships does not have satellite service. 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.</p>	<p>support for the continued use of HF also for the benefit of non-SOLAS ships (11/4/2 – 7.8.7)</p>
<p>8 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.</p> <p><u>The HF coastal stations of China is operating and playing important role for the maritime safety purpose. The Shanghai HF coastal station running DSC service receives and deals with large quantities of on-air testing from ships operating in the region of north-west Pacific annually. The Guangzhou HF coastal station operating on general communication channels provide general and safety services for both merchant ships and large quantities of fishing boats operating in South China Sea. According to the statistic information, the general communication traffic taken by Guangzhou station for fishing boats reached 211,829 minutes in the year of 2013, and 200,593 minutes in the 2014. The station completed dealing of 5 times of real distress communication from fishing boats in the HF channel in 2013, and 4 times in 2014.</u></p>	
<i>Distress</i>	
<p>8.1 It appears from information in 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 Res.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 no HF stations.</p>	

8.2	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.	
8.3	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 Res.A.801(19).	
8.4	But 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 400 Watt PEP.	
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.		
8.5	Another 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 previous solution seems to be the simpler.	

<i>Distress communications</i>		
8.6	<p>The main concern with HF is the difficulty of finding a good frequency to communicate. Automated frequency scanning could be a solution to HF communication either on radiotelephony or radiotelegraphy or data transmission. Two stations would communicate on HF but without operators knowing on which frequency they are working. Digital transmission would simplify the use of text messaging with the help of a dedicated computer.</p> <p><u>Automatic Link establishment which is a World-Wide a de facto standard could be also a solution to maritime HF communication either on radiotelephony or radiotelegraphy or data transmission.</u></p>	<p>The Automatic Link establishment is World-wide a de facto standard for HF communication links but at the time not implemented for maritime MF/HF Systems. For the modernization this functionality should be taken into account to improve the usability of the system.</p> <p>The main concern with HF is the difficulty of finding a good frequency to communicate. Automatic Frequency scanning or Automatic Link establishment which is a World-wide a de facto standard could be also a solution to maritime HF communication either on radiotelephony or radiotelegraphy or data transmission. Two stations would communicate on HF but without operators knowing on which frequency they are working. Digital transmission would simplify the use of text messaging with the help of a dedicated computer. (11/4/7).</p>
<i>SAR communications</i>		
8.7	<p>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 and 5680 kHz). One frequency could be identified for the same purpose on each maritime HF band (i.e. 4, 6, 8, 12 and 16 MHz). This would facilitate ship-aircraft communication in some situations, but also coordination of marine-air-land rescue assets in case of a major disaster as a flexible alternative to satellite communication which is not fitted on all rescue assets.]</p>	<p><u>This is to be discussed further by SAR experts.</u></p>
<i>MSI</i>		
8.8	<p>The HF NBDP MSI coast station and HF facsimile coast station infrastructure may be used for NAVDAT HF <u>with the installation of suitable transmitter equipment</u>. Further studies should be made to check the global coverage of this system based on present infrastructure taking into account the 330 HF stations</p>	

	used for general radio communications. <u>ITU-R Recommendation M. 2058. The use of this technology would require coordination by IMO.</u>	
	<i>General radio communications</i>	
8.9	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 could be a solution as explained above for distress communication, hence a tele-medical assistance, <u>radiotelephony, text and data services</u> could be performed on HF smoothly and as a complementary system to satellite communication. <u>Automatic Link Establishment could be a solution. HF systems would not have enough capacity for real time video exchanges.</u>	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. Automatic Frequency scanning or Automatic Link Establishment could be a solution as explained above for distress communication, hence a tele-medical assistance service could be performed on HF smoothly and as a complementary system to satellite communication. (11/4/7) (Also see 8.6)
	<i>Implications for the Modernization Plan</i>	
8.10	If the methodology in Resolution A.801(19) is followed, there will be sufficient HF stations available. 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.	
8.11	<u>Resolution A.801(19) may need to be revised to reflect the current distribution of HF stations and to describe the cooperation required between administrations to achieve global system.</u>	
8.12	<u>[Consider designating one frequency in each maritime HF band for distress or safety purposes by mobile stations engaged in coordinated SAR operations.]</u>	<u>To be discussed by SAR experts.</u>
	HF DSC and NBDP in sea area A3	
9	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.	

9.1	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.	
9.2	Users rarely or never use NBDP at all and therefore would most likely have difficulties in using it in an emergency situation.	
9.3	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.	
9.4	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.	
9.5	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.	
<i>Implications for the Modernization Plan</i>		
9.6	It can be concluded that NBDP can be removed as a required system as a carriage requirement for distress follow-up communication in sea area A3 and A4, 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.	
9.7	Consider the future role for HF data exchange under ITU-R Recommendation M. 1798-1 .	

NAVDAT	
<p>10 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 <u>design to operate operating</u> in the 495-505 kHz band using a multicarrier frequency modulation technique. It would coexist with the global system NAVTEX without mutual interference. NAVDAT coverage is similar to the global system NAVTEX coverage. 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.¹</p>	
<p>11 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.</p>	
<p>12 If widely adopted, NAVDAT could replace NAVTEX sometime in the future.</p>	
<p><i>Implications for the Modernization Plan</i></p>	
<p>12.1 SOLAS Chapter IV should be revised to allow <u>ships to use</u> NAVDAT service to be used in addition to or in place of NAVTEX in places where NAVDAT is available.</p>	
<p>12.2 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 IEC standards for shipborne NAVDAT equipment.</p>	

¹ 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). Recommendation ITU-R 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. Recommendation ITU-R 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.

12.3 The Modernization plan should include development of NAVTEX/NAVDAT equipment standards for receiving all HF frequencies for MSI.	
Shore to shore communications	
13 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.	that the routing of distress alerts was a continuous issue of concern and that a specific inclusion of a requirement in this regard might be needed (11/4/2 – 7.8.7)
14 SOLAS regulation V/7 includes obligations for Contracting Governments with respect to search and rescue services. An insertion such as the following could be made to regulation V/7:	
<i>1 bis. Each Contracting Government, either individually or in co-operation with other States, undertakes to ensure that they are capable on a 24-hour basis of promptly and reliably receiving distress alerts from equipment used for this purpose or from any other Contracting Governments. For that purpose, each Contracting Government undertakes to establish 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.</i>	the term MRCC was not preferred, but that the generic term RCC should be used in new and amended material, including SOLAS; (11/4/2 – 7.8.7)
<i>Implications for the Modernization Plan</i>	
14.1 Consider adding an obligation for Contracting Governments in SOLAS regulation V/7 to establish reliable shore-to-shore communications and SAR points of contact. Error! Reference source not found.	SOLAS Chapter V already had a requirement to establish RCCs and provide for the necessary communication means and that there might not be a need for a very prescriptive additional paragraph (11/4/2 – 7.8.7) in general, the inclusion of new requirements in SOLAS had to be considered with caution (11/4/2 – 7.8.7)

14.2	Review SOLAS regulation IV/5 (Undertakings by Contracting Governments) to ensure that it includes adequate responsibilities for governments (or governments through the Maritime Safety Committee) to:	some support for the proposal that 'the Maritime Safety Committee shall determine a procedure to coordinate the global distribution of coastal radio stations in order to check the proper coverage of Sea areas by promoting the cooperation between Member States (11/4/2 – 7.8.7)
.1	Provide for evaluation, recognition, review and oversight of the provision of mobile satellite communication services (see present regulation IV/4-1);	
.2	Ensure adequate global distribution of coastal radio stations;	
.3	Establish performance standards or guidance for coastal radio stations (CRS) and land earth stations (LES);	
4.3	Ensure adequate shore-based telecommunication infrastructure for SAR; and	
5.4	Ensure that shore-based facilities are adequately staffed.	
6	14.3 Establish guidelines for coastal radio stations (CRS) and consider the development of IEC standards.	
GMDSS equipment in SOLAS Chapter III		
15	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 since they address some of the functional requirements and would be more naturally located in Chapter IV.	
<i>Implications for the Modernization Plan</i>		
15.1	The communications requirements for ships and life-saving appliances in chapter III, should be moved to chapter IV.	

15.2 The "Record of Equipment" list in the certificates for these items will need to be appropriately amended.	
Emergency devices for survival craft	
16 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 since 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. ² These devices can be either survival craft radar transponders (SART) operating with X-band radar, or AIS Search and Rescue Transmitters (AIS-SART).	
17 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 are not connected to the ship via the MMSI or other coding, and the battery lifetime is also a matter of concern.	
18 More information is required from the search and rescue experts with respect to what is needed for search and rescue devices. The search and rescue experts agreed that radar SARTs and AIS-SARTs were appropriate locating devices for survival craft and that PLBs were not necessarily appropriate in this regard.	
18.1 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. 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.	

² See also Regulation IV/7.3

18.2	Radar SARTs have been provided on ships since 1986, but SAR cases don't 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.	
18.3	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.	
18.4	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 <u>ECDIS</u> radar and other electronic chart screens, <u>such as ECDIS</u> , 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.	<p>The systems on which an AIS-SART is displayed should be extended by radar noting that the performance standard MSC 192(79) is requesting that AIS can be displayed and the implementation is tested by the relevant test standard IEC 62388 Ed.2. There is no mandatory implementation on ECDIS, it is only an option – rewording is suggested. The Text message "SART ACTIVE" is a Text message where most of the equipment is able to display it but is it should be noted that the position of the incident is not available in this message.</p> <p>19.4 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 Navigation displays showing AIS</p>

	information have not been updated, will show AIS targets but will not the AIS-SART symbol. The Message "SART ACTIVE" is a safety related text message and most equipment will be able to show it – but no position is related to it. (11/4/7)
18.5 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. Note that EPIRBs might have both 121.5 homing signals and AIS location.	<u>To add details of possible new performance standards for EPRBs that possibly includes AIS-SART.</u> <u>[To add details for certain categories of ships from 11/4/2 section 7.8.7.10.]</u>
18.6 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.	
<i>Implications for the Modernization Plan</i>	
18.7 A decision needs to be made as to whether radar SARTs and AIS-SARTs are the appropriate locating devices for survival craft, or whether a device resembling a PLB would be a better choice, or if such a device should be carried in addition to SARTs.	agreed that for SAR locating reasons it was important that all survival craft should be equipped with installed locating devices (11/4/2—7.8.7)
18.8 18.7 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. <u>This may need to be coordinated with the SSE Sub-Committee and may be more appropriate as requirement in Chapter III of SOLAS.</u>	<u>This may be additional equipment which will need mentioning in paragraph 3.</u>

Application of SOLAS Chapter IV	
<p>19 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.</p>	<p>The question is how this should be formulated. The formulation of chapter V ensures that all ships are covered and administrations have the possibility to exclude ships from the obligations. This solution would have the advantage that all ships would provide a certain defined capability. If the Contracting Government sees a necessity that certain rules should not be in place for part of their fleet it would be possible to define exclusions. Note; there is only one GMDSS defined and accepted. For this system the procedures and certification requirements are defined. At IMO the discussion is limited to carriage requirement. (11/4/7)</p>
<p>20 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. <u>The SART devices are more likely to be usable by these vessels than 121.5 MHz homers. These SART/AIS-SART devices are more likely to be detected by these vessels than 121.5 MHz homers.</u></p>	<p>noted the information provided by France (WP.24) on location and homing of EPIRBs and agreed on the continuous importance of the 121.5 MHz for this purpose. It was noted that, although not currently part of the GMDSS modernization proposal, the suggestion for a requirement for a simple radio direction finder on certain SOLAS ships was considered to be desirable to enable ships to locate distress or urgency radio transmissions in the marine band and detect 121.5 MHz signals. 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 off shore industry vessels) (11/4/2 – 7.8.7)</p>

	<p>Delete last sentence should be moved to 18.5 (11/4/7)</p> <p>Noting that ITU-R RR took care for non-professional personal participating in the GMDSS by defining certificates specific for these users. (11/4/7)</p>
<i>Implications for the Modernization Plan</i>	
<p>20.1 It is not practical to extend the scope of application of SOLAS chapter IV to ships beneath 300 GT. 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.</p>	<p>from the SAR perspective, that it was essential to consider and include the needs of non-SOLAS vessels and craft in the GMDSS. It was further noted that the current review and modernization program was the opportunity to make this happen (11/4/2 – 7.8.7)</p> <p>noted the information provided by France (WP.25) concerning a proposal on basic requirements for non-SOLAS vessels and, in particular, the need for IMO to consider the development of specific advice containing basic requirements for non-SOLAS vessels. Noting that such advice could assist Member Governments to set requirements for non-SOLAS vessels, either nationally or regionally (11/4/2 – 7.8.7)</p> <p>noted further that a difference should be made between the different categories of non-SOLAS vessels, such as ships of war, troopships, cargo ships of less than 500 GRT and other ships and smaller craft including, amongst others, pleasure yachts not engaged in trade and fishing vessels (11/4/2 – 7.8.7)</p>

Standards for MOB devices to protect GMDSS integrity	
21	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.
22	Report ITU-R 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. New revisions to ITU-R M.493 and ITU-R M.541 are soon to be published and will establish an equipment class for DSC MOB devices. The revised recommendations should establish a more well-defined set of requirements for the technical performance and operational procedures for these devices.
23	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.
24	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.
<i>Implications for the Modernization Plan</i>	
24.1	Since <u>new revisions of Recommendations ITU-R M.493 and ITU-R M.541 standards</u> will soon be published by ITU, and since 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.
24.2	Since 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. <u>One measure for consideration could be an agenda item of the future competent World Radiocommunication Conference.</u> <u>Another</u> One measure for consideration could be a liaison statement to ITU-R indicating that it is desirable that <u>since</u> 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.					
Reducing false alerts					
<p>25 Unintentional false alerts have been a concern in the GMDSS, but are not considered to be critical. 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.</p>					<p>Within the discussions of ITU-R WP5B-3 on DSC, it was discussed that within the definition of the MOB devices in case of a manual shut down when an alert is active, the equipment shall transmit a self-cancel message to all stations in range before shutting down. Further Studies should be carried out to find safe ways to distinguish between a power loss and a manual shut-down of the system. (11/4/7)</p>
<p>26 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 since 406 MHz and 121.5 MHz EPIRB transmissions are not normally received on the ship.</p>					
<p>26.1 Japan provided some statistics on false alerts:</p>					
		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%	
<p>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.</p>					
<p>26.2 The United States Sarsat Office looked at the percentage of false alerts as a function of the beacon population by type:</p>					

		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 %	
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-. <u>It may be noted that SSAS is not part of GMDSS.</u>				
26.3	One proposal was to provide an audible signal when the EPIRB begins to transmit.			
26.4	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 a related proposal in the biennial agenda of the NCSR Sub-Committee (MSC 95/22, paragraph 19.10).			
Implications for the Modernization Plan				
26.5	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. <u>It should be also encouraged that consideration to diminish the false alerts caused by human error and measures should be taken to guide/educate the people involved in dealing with EPIRB, including sea fearers, operators, ship yards (both for building and recycling), inspectors and surveyors, how to handle EPIRBs in order to avoid miss-activation.</u> Note Res. A.814(19) on Guidelines for the avoidance of false distress alerts.			

Coordination with the work on the implementation of the e-navigation Strategy Implementation Plan	
<p><u>27</u> 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. The Automatic Identification System (AIS) is the newest navigation technology to be included in SOLAS, and it uses VHF maritime frequencies. GMDSS satellite service providers will provide much of the communication capacity for e-navigation. VDES is another e-navigation technology in development that uses the VHF maritime frequencies.The Global Maritime Distress and Safety System (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. The Automatic Identification System (AIS) and electronic charts display and information systems (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. 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 MHF.</p> <p><u>28</u> Various e-navigation aspects considered included:</p> <ul style="list-style-type: none"> <u>.1 e-navigation gap analysis;</u> <u>.2 the need to integrate navigation systems and communication systems;</u> <u>.3 the need to read MSI in graphical display;</u> <u>.4 functionalities for shore-to-shore communications;</u> <u>.5 common shore-based system architecture (CSSA) for communications;</u> <u>.6 usability of equipment;</u> <u>.7 software quality assurance of equipment;</u> <u>.8 man-machine interface; and</u> <u>.9 the scalability to all types of vessels.</u> 	

<p><u>28.1 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.</u></p> <p><u>2728.2 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).</u></p>	
<p><i>Implications for the Modernization Plan</i></p>	
<p>The GMDSS modernization project needs to continue to support the needs of the e-navigation strategy.</p> <p><u>28.3 The GMDSS modernization project should support the e-navigation Strategy of IMO (MSC 85 /26/Add 1 Annex 20).</u></p> <p><u>27.128.4</u></p>	
<p>Role of VDES</p>	
<p><u>2829</u> 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.</p>	<p>It has to be noted that the VDES concept includes a satellite component and that detailed studies should be carried out to verify the capabilities if this system component might be suitable to be used for the transmission of MSI information in remote areas. (11/4/7)</p>
<p><u>2930</u> The VDES concept is being developed under of Agenda Item 1.16 for WRC-15.</p>	

<p><u>Implications for the modernization Plan.</u></p> <p><u>30.1 The use of VDES needs to be considered in future possible mechanisms for the distribution of MSI.</u></p>	
<p>Role of text messages, digital data, and/or distress chat via satellite</p>	
<p><u>30.31</u> 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 can not be used for GMDSS communications. <u>Safety related messaging is also available through AIS system.</u></p>	
<p><i>Implications for the Modernization Plan</i></p>	
<p><u>30.131.1</u> <u>Consideration of the possible SAR benefits of the inclusion of text messaging, digital data, and chat messaging capabilities. Subject to the satisfaction of the SAR experts, Resolution A.1001(25) may need to</u>should<u>be reviewed to investigate whether ensure that</u> text messages, digital data, and chat can be included in GMDSS communications.</p>	<p>considered the possible SAR benefits of the inclusion of text messaging, digital data, and chat messaging capabilities (synchronous messaging) in GMDSS distress communications and noted that, in principle, this could provide advantages for distress communications. It was further noted that, in particular, the inclusion of chat messaging capabilities should be looked at with caution and needed more detailed assessment and consideration. Also the use of text messages was an issue where concerns were raised, in particular, on handling of these messages, including acknowledgment protocols and processes (11/4/2 – 7.8.7)</p> <p>It should be taken into account, that text systems to be used in SAR shall be provider independent to ensure interoperability between different systems. (11.4.7)</p>

Other revisions to SOLAS Chapter IV	
34.32 SOLAS Chapter IV includes several provisions that are obsolete or otherwise in need of revision:	
34.432.1 As decided under the High Level Review, "Security communications" and "Other communications" will be added to the functional requirements in addition to the GMDSS functions.	It was agreed that Security communication is not part of the new chapter IV. (11/4/7)
34.232.2 There are obsolete references to the International Radio Consultative Committee (CCIR).	
34.332.3 Some terms and definitions are not consistent with the Radio Regulations and other ITU-R documents.	
34.432.4 Regulation 6.2.5 refers to unspecified "other codes" to be clearly marked on the radio installation.	
34.532.5 Regulation 6.4 needs to be revised to account for a replacement radio which is not compatible with the distress panel.	
34.632.6 VHF EPIRBs have never been introduced.	
34.732.7 <u>Certain regulations such as IV/9.1.2 imply that GMDSS functions should be in a separate installation, rather than integrated into an installation that serves all of the ship's communication needs. Certain regulations such as IV/9.1.2 should be simplified since separate DSC watch receivers are not common and modern equipment practice integrates the radio functions into a single installation.</u>	Delete 33.7 the text only stats that a watch receiver shall be available the receiver may be the same or separate from that required by subparagraph .1.1. It should be noted that the existing GMDSS was build up in the view that the normal communication equipment should be used for normal operation as well as for distress purposes. (11/4/7)
34.832.8 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.	

31.932.9 Regulation IV/15.9.2 requires testing of EPIRBs every five years, which may not correspond to the battery expiration date.	
31.1032.10 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.	
<i>Implications for the Modernization Plan</i>	
31.1132.11 Definitions are needed for "Security communications" and "Other communications", as well as requirements for radio installations to perform these functions.	
31.1232.12 "Security communications" needs to be added to the functional requirements.	
31.1332.13 References to the International Radio Consultative Committee (CCIR) should be changed to the International Telecommunications Union (ITU-R).	
31.1432.14 Terms and definitions should be harmonized with the Radio Regulations and other ITU-R documents.	
31.1532.15 Regulation 6.2.5 should be revised to clarify the "other codes" required to be clearly marked on the radio installation.	
31.1632.16 Revise regulation 6.4 to account for a replacement radio which is not compatible with the distress panel.	
31.1732.17 The VHF EPIRB should be removed from SOLAS Chapter IV.	
31.1832.18 Revise regulations such as IV/9.1.2 imply that GMDSS functions should be in a separate installation, rather than integrated into an installation that serves all of the ship's communication needs.	
31.1932.19 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.	
31.20 <u>32.20</u> Consider revision to regulation IV/15.9.2 to coordinate testing of EPIRBs corresponding to the battery expiration date.	
31.21 <u>32.21</u> 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.	
31.22 <u>32.22</u> Review Chapter IV for editorial improvements.	
31.23 <u>32.23</u> Review and revise IMO resolutions consequential to the decisions made for GMDSS Modernization.	
Outline of the Modernization Plan	
<i>Revisions to SOLAS Chapter III</i>	
32 <u>33</u> The communications requirements for ships and life-saving appliances in chapter III, should be moved to chapter IV.	
33 <u>34</u> The "Record of Equipment" list in the certificates for these items will need to be appropriately amended.	
<i>Revisions to SOLAS Chapter IV</i>	
34 <u>35</u> A decision needs to be reached as to whether non-SOLAS vessels can or should be further integrated into the GMDSS. If the answer is "yes", then a means to accomplish this has to be identified. (See Error! Reference source not found.)	
35 <u>36</u> The GMDSS modernization project needs to continue to support the needs of the e-navigation strategy. (See Error! Reference source not found.)	
36 <u>37</u> SOLAS Chapter IV should be revised to provide for other GMDSS satellite service providers in addition to Inmarsat. (See Error! Reference source not found.)	

<p>3738 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 Error! Reference source not found.)</p>	
<p>3839 SOLAS Chapter IV should be revised to allow NAVDAT service to be used in place of NAVTEX in places where NAVDAT is available. (See Error! Reference source not found.)</p>	<p>It was one key idea that no equipment has to be changed due to the modernization process, Paragraph 40 is changing this paradigm – ships moving in this area would receive only NAVDAT information therefor an exchange of equipment would be required. Is that what we want? (11/4/7)</p>
<p>3940 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 Error! Reference source not found.)</p>	
<p>4041 SOLAS regulations including as a minimum IV/2, IV/11 and IV/12 will need to be revised to reflect the revised Sea Areas A3 and A4. (See Error! Reference source not found.)</p>	
<p>4142 Review SOLAS regulation IV/5 (Undertakings by Contracting Governments) to ensure that it includes adequate responsibilities for governments (or governments through the Maritime Safety Committee to:</p>	
<p>.1 Provide for evaluation, recognition, review and oversight of the provision of mobile satellite communication services (see present regulation IV/4-1);</p>	
<p>.2 Ensure adequate global distribution of coastal radio stations;</p>	
<p>.3 Establish performance standards for coastal radio stations (CRS) and land earth stations (LES);</p>	
<p>.4 Ensure adequate shore-based telecommunication infrastructure for SAR, <u>MSI and general communication</u>; and</p>	
<p>.5 Ensure that shore-based facilities are adequately staffed. (See Error! Reference source not found.)</p>	

4243	A decision needs to be made as to whether radar SARTs and AIS-SARTs are the appropriate locating devices for survival craft, or whether a device resembling a PLB would be a better choice, or if such a device should be carried in addition to SARTs. (See Error! Reference source not found.)	
4344	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. The cost of such a requirement needs to be considered. (See Error! Reference source not found.)	
4445	Definitions are also needed for “Security communications” and “Other communications”, as well as requirements for radio installations to perform these functions. (See Error! Reference source not found.)	
4546	References to the International Radio Consultative Committee (CCIR) should be changed to the International Telecommunications Union (ITU-R). (See Error! Reference source not found.)	
4647	Terms and definitions should be harmonized with the Radio Regulations and other ITU-R documents. (See Error! Reference source not found.)	
4748	“Security communications” need to be defined and added to the functional requirements. (See Error! Reference source not found.)	
4849	Regulation 6.2.5 should be revised to clarify the “other codes” required to be clearly marked on the radio installation. (See Error! Reference source not found.)	
4950	Revise regulation 6.4 to account for a replacement radio which is not compatible with the distress panel. (See Error! Reference source not found.)	
5051	The VHF EPIRB should be removed from SOLAS Chapter IV. (See Error! Reference source not found.)	
5152	Revise regulations such as IV/9.1.2 imply that GMDSS functions should be in a separate installation, rather than integrated into an installation that serves all of the ship’s communication needs. (See Error! Reference source not found.)	
5253	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 Error! Reference source not found.)	
5354 Consider revision to regulation IV/15.9.2 to coordinate testing of EPIRBs corresponding to the battery expiration date. (See Error! Reference source not found.)	
5455 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 Error! Reference source not found.)	
5556 Review Chapter IV for editorial improvements. (See Error! Reference source not found.)	
<i>Revisions to SOLAS Chapter V</i>	
5657 Consider adding an obligation for Contracting Governments in SOLAS regulation V/7 to establish reliable shore-to-shore communications and SAR points of contact. Consider requiring dedicated communication lines or other high availability and reliability connections for certain parts of the shore based network. (See Error! Reference source not found. and Error! Reference source not found.)	
<i>Other IMO Instruments</i>	
5758 Refer to the Annex of this report.	
5859 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 Res. A.814(19) on Guidelines for the avoidance of false distress alerts. (See Error! Reference source not found.)	Within ITU-R 5B, method for ITU-R M.493 had been discussed to use DSC methods of automatic cancel operations, on Class D equipment, when after a distress alert the equipment is switched off by the user because he identifies that a false alert has been transmitted, knowing that the requirement of the RR and IMO Circ. are not fulfilled. (11/4/7)
5960 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 Error! Reference source not found. and Error! Reference source not found.)	
6061 Subject to the satisfaction of the SAR experts, Resolution A.1001(25) should be reviewed to ensure that text messages, digital data, and chat can be included in GMDSS communications. (See Error! Reference source not found.)	
6462 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 Error! Reference source not found.)	
6263 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 Error! Reference source not found.)	
<i>ITU Reports and Resolutions</i>	
6364 Consideration should be given to recommending to ITU through a liaison statement, to convert ITU-R M.2285-0 into a Recommendation, including appropriate uses of GMDSS frequencies. Since MOB devices are not a required part of the GMDSS under SOLAS, there appears to be no action necessary for IMO. (See Error! Reference source not found.)	
6465 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 IEC standards for shipborne NAVDAT equipment. (See Error! Reference source not found.)	
6566 Consideration should be given to a liaison statement to ITU-R indicating that it is desirable that 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. (See Error! Reference source not found.)	
6667 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 Error! Reference source not found.)	
67 68 Consider the future role for HF data exchange under ITU-R 1798-1. (See Error! Reference source not found.)	
<i>IEC Standards</i>	
68 69 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 IEC standards for shipborne NAVDAT equipment. (See Error! Reference source not found.)	
<i>Provision of GMDSS satellite services</i>	
69 70 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 Error! Reference source not found.)	
<i>MSI providers</i>	
70 71 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 Error! Reference source not found.)	
<i>HF communications</i>	
71 72 Technological improvements can make HF easier to use.	
72 73 Consider designating one frequency in each maritime HF band for distress or safety purposes by mobile stations engaged in coordinated SAR operations.	
<i>Transitional provisions</i>	

<p>7374 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 Error! Reference source not found.)</p>	
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noted the suggestion of France (WP.26) to clarify the definition of satellite service on 406 MHz in SOLAS Chapter IV by clearly mentioning the name of the organization Cospas-Sarsat. Noting that the SOLAS definition was meant to be performance based, the JWG agreed with the existing description provided by the Joint IMO/ITU Experts Group (paragraph 2.3 of WP.26) (11/4/2 – 7.8.7)

ANNEX 1

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

2015		Notes
GMDSS.1/Circ.17 (or current edition)	GMDSS Master Plan	<ul style="list-style-type: none"> • Update lists of shore-based facilities and coast stations. • Revise or reorganize for new A3 and A4 Sea Areas. • Make provision for any additional satellite service providers and revise any Inmarsat-specific terms. • Include NAVDAT service areas, if available. • Revise sections referring to NBDP if NBDP service is discontinued.
COMSAR.1/Circ.51/Rev.6 (or current edition)	List of NAVAREA coordinators	<ul style="list-style-type: none"> • Updates as required
2013	Title	
MSC.1/Circ.1460	Guidance on the validity of radiocommunications equipment installed and used on ships	(Consider removing this circular from the list since it relates to changes in the 2012 Radio Regulations which should not be affected by GMDSS Modernization)
MSC.1/Circ.1287/Rev.1	Promulgation of maritime safety information	<ul style="list-style-type: none"> • Make provision for any additional satellite service providers and revise any Inmarsat-specific terms such as SafetyNET. • Include NAVDAT service, if available. • Revise sections referring to NBDP if NBDP service is discontinued.
COMSAR.1/Circ.53/Rev.2	List of land earth stations (LES) operation coordinators in the Inmarsat system	<ul style="list-style-type: none"> • Make provision for any additional satellite service providers.
2012		
Res. MSC.347(91)	Recommendation for the protection of the AIS VHF data link	<ul style="list-style-type: none"> • Update AIS radio channels
MSC.1/Circ.1414	Guidance to prospective GMDSS satellite service providers	<ul style="list-style-type: none"> • Change “COMSAR” references to “NCSR” • Refers to “nine” GMDSS functions – now ten
MSC/Circ.1040/Rev.1	Guidelines on annual testing of 406 MHz satellite EPIRBs	<ul style="list-style-type: none"> • Ensure guidelines are relevant for Second Generation Beacons • Provide for EPIRBs with AIS locators
COMSAR.1/Circ.50/Rev.3	Distress priority communications for RCC from shore-to-ship via Inmarsat	<ul style="list-style-type: none"> • Consider whether similar circular is needed for additional satellite providers

2011		
Res. A.1051(27)	IMO/WMO Worldwide Met-Ocean Information and Warning Service – Guidance Document	<ul style="list-style-type: none"> • Make provision for any additional satellite service providers and revise any Inmarsat-specific terms such as SafetyNET
MSC.1/Circ.1403	Revised NAVTEX manual	<ul style="list-style-type: none"> • Make provision for any additional satellite service providers and revise any Inmarsat-specific terms such as SafetyNET. • Include NAVDAT service, if available. • Revise sections referring to NBDP if NBDP service is discontinued.
2010		
Res. MSC.306(87)	Revised performance standards for Enhanced Group Call (EGC) equipment	<ul style="list-style-type: none"> • Make provision for any additional satellite service providers, if necessary.
MSC.1/Circ.1389	Guidance on procedures for updating shipborne navigation and communication equipment	(Consider removing this circular from the review list since it should not be affected by GMDSS Modernization)
MSC.1/Circ.1364	Revised International SafetyNet Manual	<ul style="list-style-type: none"> • Make provision for any additional satellite service providers and revise any Inmarsat-specific terms such as SafetyNET. - OR - • Develop parallel manual for any new satellite service providers.
2009		
Res.A.1021(26)	Code on alerts and indicators	<ul style="list-style-type: none"> • Review to determine if alerts generated by communication systems should be included. • Any new or revised instruments should be consistent with this code.
COMSAR.1/Circ.45	Guidance on distress alerts	(Consider removing this circular from the review list since it should not be affected by GMDSS Modernization)
2007		
Res. 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"> • Description of functional requirements will need revision • Possible addition of extra data messages types such as chat and text • Interoperability issues
Res. MSC.246(83)	Adoption of performance standards for survival craft AIS search and rescue transmitters (AIS-SART) for use in search and rescue operations	(Consider removing this resolution from the review list since it should not be affected by GMDSS Modernization)

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"> • Make provision for any additional satellite service providers and revise any Inmarsat-specific terms such as SafetyNET. - OR - • Develop parallel manual for any new satellite service providers.
2005		
COMSAR.1/Circ.36	Broadcast of warnings for tsunamis and other natural disasters	<ul style="list-style-type: none"> • Make provision for any additional satellite service providers and revise any Inmarsat-specific terms such as SafetyNET. - OR - • Develop parallel manual for any new satellite service providers.
COMSAR/Circ.37	Guidance on minimum communication needs of Maritime Rescue Co-ordination Centres (MRCCs)	<ul style="list-style-type: none"> • Make provision for any additional satellite service providers and revise any Inmarsat-specific terms such as SafetyNET. • Review section on Telex link – is it used?
2004		
COMSAR/Circ.32	Harmonization of GMDSS requirements for radio installations on board SOLAS ships	<ul style="list-style-type: none"> • Some terms need revision, <i>i.e.</i> “radar transponder”; “A3” and “A4” will have different meanings • Update channel 16 watch requirements • Is description of radio work station consistent with current bridge design? • Make provision for any additional satellite service providers
COMSAR/Circ.34	Clarification in the use of NAVTEX B3B4 characters = 00 and NAVTEX service areas	(Should not require revision if guidance is still considered to be needed.)
COMSAR/Circ.35	Recommendations on medium frequency/high frequency (MF/HF) digital selective calling (DSC) test calls to coast stations	(Should not require revision if guidance is still considered to be needed.)
2003		
Res. A.954(23)	Proper use of VHF channels at sea	(Probably does not have to be revised as a result of Modernization, but curiously does not mention DSC calling.)
Res. MSC.149(77)	Adoption of the revised performance standards for survival craft portable two-way VHF radiotelephone apparatus	<ul style="list-style-type: none"> • May need to be revised depending upon decision on aeronautical frequencies.

Res. MSC.148(77)	Adoption of the revised performance standards for narrow-band direct-printing telegraph equipment for the reception of navigational and meteorological warnings and urgent information to ships (NAVTEX)	<ul style="list-style-type: none"> • May need to be revised depending upon decision on NBDP.
2002		
Res. 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"> • 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)
Res. MSC.130(75)	Performance standards for Inmarsat ship earth stations capable of two-way communications	<ul style="list-style-type: none"> • Make provision for any additional satellite service providers. - OR - • Develop parallel resolution for any new satellite service providers.
MSC/Circ.1038	Guidelines for general radiocommunications	<ul style="list-style-type: none"> • Requires revision with respect to “general communications”
MSC/Circ.1039	Guidelines for shore-based maintenance of satellite EPIRBs	<ul style="list-style-type: none"> • Revise to include AIS locators • Delete L-band EPIRB • Review for needed changes in respect of Second Generation Beacons
COMSAR/Circ.29	Guidance on the voluntary use of the standardized questionnaires and formats for reporting false alert in collecting data on false alerts	<ul style="list-style-type: none"> • Revise for additional satellite service providers • Assess usefulness of this circular <p><u>To be removed from the list.</u></p> <p>• <u>May be suppressed</u></p>
2001		
COMSAR.1/Circ.28	International NAVTEX service	<ul style="list-style-type: none"> • Assess current usefulness of this circular <p><u>To be removed from the list.</u></p> <ul style="list-style-type: none"> •
COMSAR.1/Circ.25	Procedure for responding to DSC distress alerts by ships	<ul style="list-style-type: none"> • Assess current usefulness of this circular

1999		
Res A.887(21)	Establishment, updating and retrieval of the information contained in the registration databases for the GMDSS	<ul style="list-style-type: none"> • Revise for additional satellite service providers • Clarify whether satellite service provider identities should be included in databases such as List V and MARS • Include procedure for International Beacon Registration Database (IBRD)
1998		
Res. MSC.80(70), Annex 1	Recommendation on performance standards for on-scene (aeronautical) portable two-way VHF radiotelephone apparatus	(Consider removing this resolution from the review list since it should not be affected by GMDSS Modernization) <u>To be removed from the list</u>
Res. MSC.80(70), Annex 2	Recommendation on performance standards for on-scene (aeronautical) two-way VHF radiotelephone apparatus for fixed installations	(Consider removing this resolution from the review list since it should not be affected by GMDSS Modernization) <u>To be removed from the list</u>
MSC/Circ.862	Clarifications of certain requirements in IMO performance standards for GMDSS equipment	<ul style="list-style-type: none"> • If these clarifications are included in revised instruments, the circular might be revoked
MSC/Circ.883	Maritime safety and Inmarsat ship earth station barring procedures	<ul style="list-style-type: none"> • Revise for additional satellite service providers
COMSAR/Circ.13	Shore-to-ship communications during a distress	(Consider removing from the review list since it no longer appears on IMO list of COMSAR Circulars) <u>To be removed from the list.</u>
COMSAR/Circ.15	Joint IMO/IHO/WMO manual on MSI	(Consider removing from the review list since it no longer appears on IMO list of COMSAR Circulars) <u>To be removed from the list.</u>
COMSAR/Circ.17	Recommendation on use of GMDSS equipment for non-safety communications	<ul style="list-style-type: none"> • Consider including in a revision of MSC/Circ.1038
1997		
MSC/Circ.803	Participation of non-SOLAS ships in the GMDSS	<ul style="list-style-type: none"> • Should be reviewed and generally updated (reference to 2182 kHz alarm signal which has been removed in COLREG by Res. A.1004(25)/Rev.1).
1995		
Res. A.814(19)	Guidelines for the avoidance of false distress alerts	(Consider removing from the review list – guidance remains relevant) <u>To be removed from the list.</u>

Res. A.813(19)	General requirements for the electromagnetic compatibility (EMC) for all electrical and electronic ship's equipment	(Consider removing from the review list – requirements remain relevant) <u>To be removed from the list.</u>
Res. A.811(19)	Performance standards for a shipborne integrated radiocommunication system (IRCS) when used in the GMDSS	<ul style="list-style-type: none"> (Note current IEC project on IRCS)
Res. A.802(19) as amended by MSC.247(83)	Performance standards for survival craft radar transponders for use in search and rescue operations	<ul style="list-style-type: none"> Should be reviewed and updated at least with respect to ITU-R M.628-5
Res. 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"> Will need to be revised in respect of new A3 and A4 Sea Areas
Res. A.804(19) as amended by 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"> Will need to be revised to include additional satellite service providers May need to be revised with respect to decisions on NBDP
Res. A.803(19) as amended by MSC.68(68) annex 1	Performance standards for shipborne VHF radio installations capable of voice communications and digital selective calling	(Consider removing from the review list – requirements remain relevant) <u>To be kept in the list.</u>
Res. A.805(19)	Performance standards for float-free VHF emergency position-indicating radio beacons	<ul style="list-style-type: none"> Revoke <u>To be suppressed.</u>
Res. A.806(19) as amended by 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"> May need to be revised with respect to decisions on NBDP
Res. A.807(19) as amended by MSC.68(68) annex 4	Performance standards for Inmarsat-C ship earth station capable of transmitting and receiving direct-printing communications	(Consider removing from the review list – requirements remain relevant) <u>To be kept in the list.</u>
Res. A.809(19)	Performance standards for survival craft two-way VHF radiotelephone apparatus	(Consider removing from the review list – requirements remain relevant) <u>To be removed from the list.</u>
Res. A.808(19)	Performance standards for ship earth stations capable of two-way communications	<ul style="list-style-type: none"> Will need to be revised to include additional satellite service providers
Res. A.810(19) as amended by 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"> On NCSR 3 agenda for revision
1994		
COM/Circ.117	Clarifications of the application of certain provisions of Chapter IV of the SOLAS Convention	<ul style="list-style-type: none"> Should be able to be revoked after adoption of revised Chapter IV
1993		
Res. A.763(18) as amended by Res. A.810 (19) as amended by MSC.56(66), 120(74)	Performance standards for float-free satellite emergency position-indicating radio beacons (EPIRBs) operating on 406 MHz	<ul style="list-style-type: none"> No change - Does not apply to EPIRBs installed on or after 23 November 1996

Res. A.762(18) as amended by Res. A.809 (19) as revised by MSC.149(77)	Performance standards for survival craft two-way VHF radiotelephone apparatus	<ul style="list-style-type: none"> No change - Does not apply to VHF radiotelephone apparatus installed on or after 23 November 1996
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"> Should be able to be revoked after adoption of revised Chapter IV
1991		
Res. A.707(17)	Charges for Distress, Urgency and Safety Messages through the Inmarsat System	<ul style="list-style-type: none"> Revise for additional satellite service providers Consider provision of shore-to-ship MSI broadcasts without charge to the originator.
Res. 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"> References to Sea Areas and Inmarsat need to be revised
Res. A.703(17)	Training of radio personnel in the GMDSS	(Consider removing from the review list – requirements remain relevant) <u>To be removed from the list.</u>
Res. 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"> May need to be revised with respect to decisions on NBDP
Res. 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"> May need to be revised with respect to decisions on NBDP
Res. A.698(17) as amended by Res. A.808(19) and MSC.149(77)	Performance standards for ship earth stations capable of two-way communications	<ul style="list-style-type: none"> No change - Does not apply to stations installed on or after 23 November 1996
Res. 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"> Should be revised after adoption of revision of Resolution A.810 (19)
Res. 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	(Consider removing from the review list – requirements remain relevant) <u>On NCSR 3 agenda for revision.</u> <u>To be kept in the list.</u>
COM/Circ.105 + Corr.1	Clarification of certain provisions of the 1998 SOLAS amendments for the GMDSS	<ul style="list-style-type: none"> Should be able to be revoked after adoption of revised Chapter IV
1989		
Res. A.663(16) as amended by Res. 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"> No change - Does not apply to stations installed on or after 23 November 1996
Res. A.662(16)	Performance standards for float-free release and activation arrangements for emergency radio equipment	(Consider removing from the review list – requirements remain relevant) <u>To be removed from the list.</u>
1987		

Res. A.617(15)	Implementation of the NAVTEX system as a component of the world-wide navigational warning service	<ul style="list-style-type: none"> Consider for revocation – may have been overtaken by more recent instruments, <i>e.g.</i> NAVTEX Manual
Res. A.616(15)	Search and rescue homing capability	<ul style="list-style-type: none"> Needs to be revised to provide for possibility of AIS location from ship and EPIRB transmitters
Res. A.614(15)	Carriage of radar operating in the frequency band 9,300-9,500 Mhz	(Remove from review list – not GMDSS related) <u>To be removed from the list.</u>
Res. A.613(15) as amended by Res. 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"> No change - Does not apply to equipment installed on or after 23 November 1996
Res. A.612(15) as amended by Res. A.805(19)	Performance standards for float-free VHF emergency position-indicating radio beacons	<ul style="list-style-type: none"> <u>Revoke</u> <ul style="list-style-type: none"> <u>To be suppressed.</u>
Res. A.610(15) as amended by Res. 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"> No change - Does not apply to equipment installed on or after 23 November 1996
Res. A.609(15) as amended by Res. 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"> No change - Does not apply to equipment installed on or after 23 November 1996
1985		
Res. A.570(14)	Type approval of ship earth stations	<ul style="list-style-type: none"> Make provision for any additional satellite service providers.
1983		
Res. A.530(13)	Use of radar transponders for search and rescue purposes	(Consider removing from the review list – guidance remains relevant) <u>To be removed from the list.</u>
Res. 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"> No change - Does not apply to equipment installed on or after 1 July 2005
1975		
Res.A.343(IX)	Recommendation on methods of measuring noise levels at listening posts	<ul style="list-style-type: none"> IEC references and “IMCO” need to be updated

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.

Application of SOLAS Chapter IV

2 “Present regulations” in regulation IV/1 actually refers to SOLAS Chapter I, Part A, but this is not clear. For instance, SOLAS V/1 is a clearer application statement and could be used to apply the GMDSS to non-Convention ships whilst allowing Member Governments to determine the actual application to non-Convention ships.

3 The Sub-committee was informed that the Committee was considering the implementation of instruments and related matters, including the application of all SOLAS chapters, and that a decision should await their decision.

4 It was decided not to try to apply Chapter IV to additional non-Convention ships, noting that the GMDSS was the international system for distress and safety, established by the Radio Regulations. The application to non-Convention ships, especially fishing vessel could be difficult. (Ref: IMO/ITU EG 10/4 paragraph 3.5, NCSR 2/13 paragraphs 26-31)

Shore-to-shore communications

5 It was observed that gaps in shore-to-shore communications was harming the functioning of the GMDSS system. It was suggested to consider the Cospas-Sarsat land network to support the routing of all GMDSS long distance radiocommunication systems such as Inmarsat, HF and MF distress alerts. Views were expressed that shore-to-shore communications might be out of place in SOLAS chapter IV. It was, however, supported that the CG should take another look at how best this issue could be addressed. (Ref: NCSR 2/13 paragraphs 48-50)

Watches

6 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)

False alerts

7 Several proposals were made relating to the reduction of false alerts. For various reasons, including cost, complexity, and limited effectiveness, none were adopted. The matter of improving access to information of ships in distress was also discussed. It was, however, noted that this could be a sub-issue to reduce the effects of false alerts. However, it was agreed that further work needed to be done to reduce the amount of false alerts and that most EPIRB false alerts were the result of human error. (Ref: NCSR 2/13 paragraphs 57 & 59)

On-air test features

8 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

9 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 60-63)

Other proposals

10 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 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 36-45))
- .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 2-3, and table rows 4 and 8))
(COMSAR 14/7)
