

COMSAR 16 – WP.6 – Scoping Exercise

Submitted by IHB

SUMMARY

Executive Summary: This document provides details of the COMSAR 16 scoping exercise to establish the need for a review of the elements and procedures of the GMDSS,

Action to be taken: Paragraph 2.

Related documents: COMSAR 16/17 dated 23 March 2012

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

SUB-COMMITTEE ON
RADIOCOMMUNICATIONS AND SEARCH
AND RESCUE
16th session
Agenda item 3.3

COMSAR 16/WP.6
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DISCLAIMER

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GLOBAL MARITIME DISTRESS AND SAFETY SYSTEM (GMDSS)

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

Report of the Drafting Group

General

1 The Drafting Group on the Finalization of the Scoping exercise met on 14 March 2012 under the chairmanship of Mr. Kim Fisher (IEC).

2 The group was attended by representatives from the following Member States:

GERMANY
IRELAND
IRAN (ISLAMIC REPUBLIC OF)
JAPAN
NORWAY

SPAIN
UNITED ARAB EMIRATES
UNITED KINGDOM
UNITED STATES

and an observer from the following non-governmental organization in consultative status:

COMITÉ INTERNATIONAL RADIO-MARITIME (CIRM)

Terms of reference

3 The Drafting Group on the Finalization of the Scoping exercise, taking into account documents COMSAR 16/3, COMSAR 16/3/6, COMSAR 16/3/8, COMSAR 16/3/9 and COMSAR 16/4, and decisions of, and comments and proposals made in Plenary, should:

- .1 based on document COMSAR 16/3, annex 1, finalize the draft Work Plan as a new unplanned output on the "Revision and modernization of the Global Maritime Distress and Safety System" for approval by the Committee;

- .2 prepare draft Terms of Reference for the Correspondence Group on the Scoping exercise for the intersessional work to be done between MSC 90 and COMSAR 17, subject to approval of the Work Plan by the Committee;
- .3 based on information provided in document COMSAR 16/3, annex 2, finalize a draft MSC circular on Guidance to prospective GMDSS satellite service providers;
- .4 advise the Technical Working Group on its views on the number of days needed for the eighth meeting of the Joint IMO/ITU Experts Group, provisionally scheduled to take place in the week from 8 to 12 October 2012; and
- .5 submit its report on Wednesday, 14 March 2012.

Draft revised work plan

4 The group considered documents COMSAR 16/3/6, COMSAR 16/3/8, COMSAR 16/3/9 and were of the view that all the issues in the documents would be covered by the draft Work Plan. Accordingly, the group recommended that the documents be forwarded to the proposed Correspondence Group to be established by the Sub-Committee, subject to endorsement by the Committee. In particular, the group was of the opinion that the issues in paragraph 5 of document COMSAR 16/3/8 merited further consideration.

5 The group reviewed the draft Work Plan as prepared by the Correspondence Group (COMSAR 16/3, annex 1) and prepared a revised text, as given in annex 1.

Draft Terms of Reference for the Correspondence Group

6 The group prepared draft Terms of Reference for a new proposed Correspondence Group to make further progress into the matter, as given in annex 2.

Draft MSC circular on Guidance to prospective GMDSS satellite service providers

7 The group reviewed the draft process for approving additional GMDSS satellite service providers as prepared by the Correspondence Group (COMSAR 16/3, annex 2) and prepared a draft MSC circular on Guidance to prospective GMDSS satellite service providers for approval by the Committee, as given in annex 3.

8 The group noted that there would be a need in the future to refer to satellite service providers in a generic way as opposed to always making reference to Inmarsat.

9 A query was raised concerning the information required to be provided with an application from a potential satellite service provider. Some of the information would be company confidential and the total volume of information would be excessive to study at the session of the COMSAR Sub-Committee.

10 The delegation of the United Arab Emirates was of the view that the COMSAR Sub-Committee would request IMSO to undertake the Technical and Operational assessment to produce the report for the evaluation and looking at the complexity of this assessment, a lot of resources and time would be needed to put into this by IMSO; therefore, the financial cost of such an assessment might be a burden on satellite service providers. The matter of the assessment cost should be studied carefully and levied appropriately as not to discourage any new satellite service providers from applying.

Eighth session of the Joint IMO/ITU Experts Group

11 The group, having considered the outcome of WRC-12 and the preparations for WRC-15 and the work for the scoping exercise for the review of the GMDSS, considered that a period of five working days would be necessary for the eighth session, provisionally scheduled for 8 to 12 October 2012.

Action requested of the Sub-Committee

- 12 The Sub-Committee is invited to approve the report in general and, in particular, to:
- .1 agree to the draft revised Work Plan as a new unplanned output on the "Revision and modernization of the Global Maritime Distress and Safety System" for approval by the Committee (paragraphs 4 and 5, annex 1);
 - .2 approve the draft Terms of Reference for the Correspondence Group on the Review of the GMDSS for the intersessional work to be done between MSC 90 and COMSAR 17, subject to approval of the Work Plan by the Committee (paragraph 6, annex 2); and
 - .3 agree to the draft MSC circular on Guidance to prospective GMDSS satellite service providers for approval by the Committee (paragraphs 7 and 8, annex 2);
 - .4 note the views expressed by the delegation of the United Arab Emirates with respect to the application of any new satellite service providers (paragraph 10); and
 - .5 note the group's advice to the Technical Working Group that a period of five working days were sufficient for the eighth meeting of the Joint IMO/ITU Experts Group, provisionally scheduled for 8 to 12 October 2012 (paragraph 11).

ANNEX 1

DRAFT WORK PLAN

Proposal for Review and Modernization of the Global Maritime Distress and Safety System (GMDSS)

Introduction

1 This proposal for inclusion of an unplanned output is submitted in accordance with the Guidelines on the organization and method of work of the Committees (MSC-MEPC.1/Circ.4), taking into account the High-level Action Plan for the Organization and priorities for the 2010-2011 biennium (resolution A.1012(26)).

2 The work item is to review the Global Maritime Distress and Safety System (GMDSS), and then to develop a modernization programme. The modernization programme would implement findings of the review, include more modern and efficient communications technologies in the GMDSS, and support the communications needs of the e-navigation strategy.

3 The review, with particular reference to the Human Element, will include:

a high-level review, containing as a minimum:

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

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

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

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

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

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

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

a detailed review, containing as a minimum:

.6 the issue of training and performance of crews on board ships, considering the certification and renewal of qualifications and also noting the possible reduction of technical knowledge and skills by operators;

- .7 equipment carriage requirements for duplication, maintenance, equipment interfacing, back-up support systems and power supplies;
- .8 the possible inclusion of Automatic Identification System (AIS) functions;
- .9 the possible inclusion of Long-range identification and tracking of ships (LRIT) functions;
- .10 the possible inclusion of Ship Security and Alerting System (SSAS) functions;
- .11 the role of Narrow Band Direct Printing (NBDP);
- .12 the role of MF/HF Digital Selective Calling (DSC) and the complexity of some of the signaling functions;
- .13 problems which might arise due to a lack of HF stations in future;
- .14 the usage of satellite equipment as an alternative in Sea Areas A2 currently based around MF/HF DSC;
- .15 voice communications as an integral part of the GMDSS, benefiting search and rescue operations;
- .16 possible new requirements for lifeboats and liferafts, for instance to provide long-range communications;
- .17 the expected evolution of satellite EPIRB systems, such as the Medium Earth Orbit Search And Rescue system (MEOSAR);
- .18 the further evolution of Maritime Safety Information broadcast systems, taking into account the ongoing work in IHO and WMO;
- .19 possible alignment between chapters III, IV, V and XI-2 of SOLAS, in particular with regard to type approval, secondary equipment and maintenance arrangements and their regulatory status (i.e. mandatory or discretionary);
- .20 the need to indicate the facilities required for capacity-building; and
- .21 assess whether to increase the use of goal-based methodologies when reviewing the regulations and regulatory framework for GMDSS in SOLAS chapters IV and V and the STCW Convention, to provide flexibility to allow the GMDSS to adapt to new and evolving technologies without major revision of the SOLAS and STCW Conventions in future.

The review should take place over a three-year period (2013-2015). The inclusion of timelines and an appreciation of workload would allow all to plan and participate. The review process is illustrated in a flow diagram in appendix A.

4 A further two-year period is envisaged (2015-2017) for the GMDSS modernization plan. This will be followed by development of legal instruments, revision/development of relevant performance standards and an implementation period.

Relationship to IMO's objectives

5 IMO's objectives are generally summarized as safe, secure and efficient shipping on clean oceans. The maritime communications system is essential to achieving all of these objectives. Information passed between ships and between ships and shore facilities ensures safe passages on the waterways of the world. In order to achieve safe, secure and efficient shipping on clean oceans, modernization of the GMDSS system is essential.

Compelling need

6 As the world continues to move into the "information age," there is a need for an ever-increasing exchange of information, but there is a finite supply of radio spectrum for wireless communications. Consequently, new services seek to use spectrum allocated to others. Existing services must use the spectrum they have been allocated in the most efficient manner. The current GMDSS is not optimized for efficient spectrum use and there is a growing demand for maritime communication resources, such as those that will result from the e-navigation initiative.

7 The GMDSS was designed over 25 years ago. There has not been a full review since its implementation in 1999 and technology has developed significantly in that time. There are GMDSS elements where improvement could be brought about, e.g. the acceptance, procedures and lack of usability and consequential usage of DSC, managing the cessation of international telex, and to examine the continued use of narrow-band direct-printing in certain sea areas. The elements that will be identified may need to be examined and reviewed as a matter of some urgency.

8 Consideration should be given to any compatibility that there may be between the GMDSS, current technologies like AIS, and new or emerging technologies that are over the horizon. The emerging e-navigation facets should also be considered, to ascertain what parts may or may not, be beneficial to this mature distress alerting and communications system.

9 It is also important that any review of the GMDSS takes into account the *raison d'être* for each of the system's elements. It is important to consider the information that is conveyed by each element of the overall system in terms of importance or criticality, which aspect of a ship's mission is it supporting, timeliness/latency, volume of data involved, and so on. The time has come for maritime communications to be redefined and thus add more value by delivering increases in safety, efficiency and quality of life for those serving at sea.

10 The use of GMDSS-compliant and GMDSS-compatible equipment on board ships is widely implemented and there is a persistent need for compatibility between SOLAS and other ships, including recreational vessels. In this regard it is noted that SOLAS chapter V has been applied generally to all ships on all voyages and that a similar approach could be taken in reviewing chapter IV. IMO has adopted a similar stance in the development of e-navigation.

Analysis of the issue

11 The GMDSS already provides for exchange of information vital for maritime safety and for certain general communications. E-navigation initiatives will create the need for additional communications capabilities. The project is intended to allow the evolution of maritime communications to meet these needs and improve service through the introduction of modern technologies. Elements to be considered include the following:

- .1 Which basic communication capabilities are properly part of the GMDSS and which could become a part of the developing e-navigation concept?
- .2 VHF and HF equipment might employ more modern digital technology.
- .3 New developments may be employed, for instance by non-GMDSS communication providers, as well as the use of mobile phones, satellite systems, including regional satellite systems, and the possible introduction of new technologies in future.
- .4 Survival craft communications, homing and locating equipment.
- .5 Examination of how maritime safety information is provided to ships.
- .6 Benefits of including additional satellite service providers to enter the GMDSS.
- .7 Identify elements that may be phased out from current carriage requirements.

12 The following goals should be achieved without a complete redesign of the communications regime:

- .1 continue to be effective for both SOLAS and non-SOLAS ships in the face of changing ship traffic patterns, patterns of use, skills, knowledge and resources;
- .2 within the definition of "effective" to consider fitness for purpose, need, benefit and cost and recognize the existing investment in the GMDSS;
- .3 readily able to evolve without undue burdens on administrations or industry;
- .4 to take advantage, where appropriate, of changes and advances in technology;
- .5 to recognize the importance of human factors in the proper use of the GMDSS;
- .6 to recognize the development of e-navigation; and
- .7 ensure capacity-building.

Analysis of the implications

13 Revisions to chapter IV of SOLAS may be expected, along with revised resolutions and circulars that support chapter IV. Chapter IV may become strictly goal-based, with more detailed solutions contained in one or more resolutions, or perhaps a Code as has been done with SOLAS chapters II-2 and III.

14 Impact analysis and evaluation of cost implications resulting from amendments to legislation, administration changes, and modernization of the facilities and technologies within the GMDSS need to be undertaken, taking into account the facilities required for capacity-building.

15 The e-navigation initiative will need to focus on the challenge of keeping shipboard systems up to date, error-free and securely implemented. The GMDSS will also need to examine this issue. Convergence of technologies may require a similar approach to some GMDSS elements. The existing system of standards setting may not be suitable in all cases to all elements of a modernized GMDSS, due to the rapid change and increasing use of software-based systems.

Benefits

16 Do the benefits vis-à-vis enhanced maritime safety, maritime security or protection of the marine environment expected to be derived from the inclusion of the new item proposed justify such action?

- .1 Evolving technology and e-navigation applications will continue to drive change in the maritime communications system. With or without a GMDSS modernization plan, shore facilities and ship operators will have more economical and efficient choices for exchanging the information they need for the safe operation of ships. Unless the GMDSS can evolve to include these technologies, ship operators may find themselves carrying obsolete equipment for the sole purpose of meeting a SOLAS requirement. In addition, if future advances are not well controlled there is a risk that increasing complexity will cause incompatibility between equipment, in turn resulting in decreased availability and adverse safety outcomes.
- .2 It may be that the review will confirm that enhanced safety, response to alerts and follow-up communications, especially in the Polar Regions, could be attained by the integration of newer technologies and existing systems.
- .3 The examination of the technology used for the provision of maritime safety information may result in alternative proposals to allow for more rapid dissemination of maritime safety information.
- .4 The e-navigation strategy and the pulling together of some of the salient strands within this visionary introduction of technology and systems, together with the GMDSS and its mature existing technologies, can only lead to overall improvement in safety and efficiency. Enhanced use of allocated spectrum can only be of benefit where the provision in some areas is congested and in others underutilized and where, internationally, the assignment becomes more competitive. Current and emerging technologies could also be investigated so that more efficient use of spectrum would be provided.
- .5 The key benefits of the proposed actions would be to all seafarers, shore communications providers, rescue coordination centres, shipowners and managers, surveyors, training establishments, those involved in the provision of maritime communications equipment, classification societies and regulators. The proposed actions aim to ensure that the GMDSS continues to be fit for purpose for the 21st century, to allow modern technologies to be incorporated into the GMDSS, thus enhancing and improving safety of life at sea.

- .6 The benefits that are expected to emerge, include enhancement of safety in general, and navigation safety in particular, security, environmental protection and general communications for the industry, while mariners would benefit from a GMDSS that is fully modern and responsive to user needs.

Industry standards

17 IMO has a close relationship with the United Nations Specialized Agency, the International Telecommunications Union (ITU), and has formed a Joint Experts Group with ITU to ensure close coordination on revisions required to the Radio Regulations and associated ITU Recommendations.

18 IMO has the benefit of a close relationship with the International Electrotechnical Commission (IEC), and IEC Technical Committee 80 (TC 80), Maritime navigation and radiocommunication equipment and systems. TC 80 has continued to develop standards as required, throughout the existence of the GMDSS. Standards, during review, are improved to reflect technological advancement and improvement. It is unlikely that new standards will be needed for existing technologies, however, some existing technology standards will require to be revised into the future (examples could include AIS, DSC, VHF radio, EPIRBs and LRIT equipment), but the continued support of TC 80 may be expected for new technologies, as required.

19 IMO also has a close relationship with the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA). IALA has actively contributed to the development of e-navigation strategy and development and maintenance of ITU-R Recommendations, and also publishes IALA Recommendations, guidelines and other useful documents for ship and shore facilities including GMDSS.

Output

20 The intended output is described in SMART terms (specific, measurable, achievable, realistic, time-bound):

- .1 Specific – A review will be completed first, followed by a GMDSS Modernization Plan leading to development of new and/or revised instruments.
- .2 Measurable – The project is measurable in terms of meeting its time goals.
- .3 Achievable – The involved subsidiary bodies of the Committee have the expertise to complete the project, and have appropriate liaisons with outside bodies such as ITU, IEC and IALA to complete the work.
- .4 Realistic – There are no technological reasons why the project cannot be completed.
- .5 Time-bound – COMSAR 19 is to complete the review at its (expected) March 2015 meeting. The Modernization Plan is to be completed at the (expected) COMSAR 21 meeting in 2017, but possibly earlier depending upon the amount of intersessional work that can be completed.

Human element

21 See the MSC-MEPC.7/Circ.1 checklist in appendix B. The Human Element will be embodied in the process from the beginning to ensure the technology is fit for purpose. [The Human Element Working Group will be kept informed throughout the process.] The checklist is designed to review projects at their completion, so the marks on the checklist indicate the anticipated outcome. The checklist should be reviewed at the completion of the project.

Priority/Urgency

22 How is the proposed item related to the scope of the Strategic Plan for the Organization and how does it fit into the High-level Action Plan? With reference to resolution A.1038(27), the following elements of the High-level Action Plan are related to the GMDSS Modernization project:

- 5.1 Ensuring that all systems related to enhancing the safety of human life at sea are adequate, including those concerned with large concentrations of people
 - 5.1.2 Development and review of safe evacuation, survival, recovery and treatment of people following maritime casualties or in case of distress
GMDSS communications play a vital role in distress response.
 - 5.1.3 Enhance the safety of navigation in vital shipping lanes
GMDSS communications are essential to safe navigation and will play a key role in the implementation of the e-navigation strategy.
- 5.2 Enhancing technical, operational and safety management standards
 - 5.2.1 Keep under review the technical and operational safety aspects of all types of ships, including fishing vessels
The GMDSS Modernization project will be the first comprehensive review of the GMDSS since its development 25 years ago. Fishing vessels must have communication systems compatible with the GMDSS.
 - 5.2.4 Keep under review measures to improve navigational safety, including ships' routing, ship reporting systems, vessel traffic services, requirements and standards for shipborne navigational aids and systems and Long-range identification and tracking of ships (LRIT)
GMDSS communications are essential to safe navigation and will play a key role in the implementation of the e-navigation strategy.
 - 5.2.5 Monitor and evaluate the operation of the Global Maritime Distress and Safety System (GMDSS)
The GMDSS Modernization project will be the first comprehensive review of the GMDSS since its development 25 years ago.
 - 5.2.6 Development and implementation of the e-navigation strategy
GMDSS communications are essential to safe navigation and will play a key role in the implementation of the e-navigation strategy.

- 10 IMO will apply goal-based standards for maritime safety
- 10.1 Further develop measures to apply goal-based standards for maritime safety and environmental protection
GMDSS regulations already employ goal-based standards (see SOLAS regulation IV/4). The Modernization project will consider further application of the concept.
- 23 Target completion date: 2017 (2016 with extensive intersessional work)
- 24 Timescale needed for the IMO organ to complete the work:
- A project schedule is in appendix C.

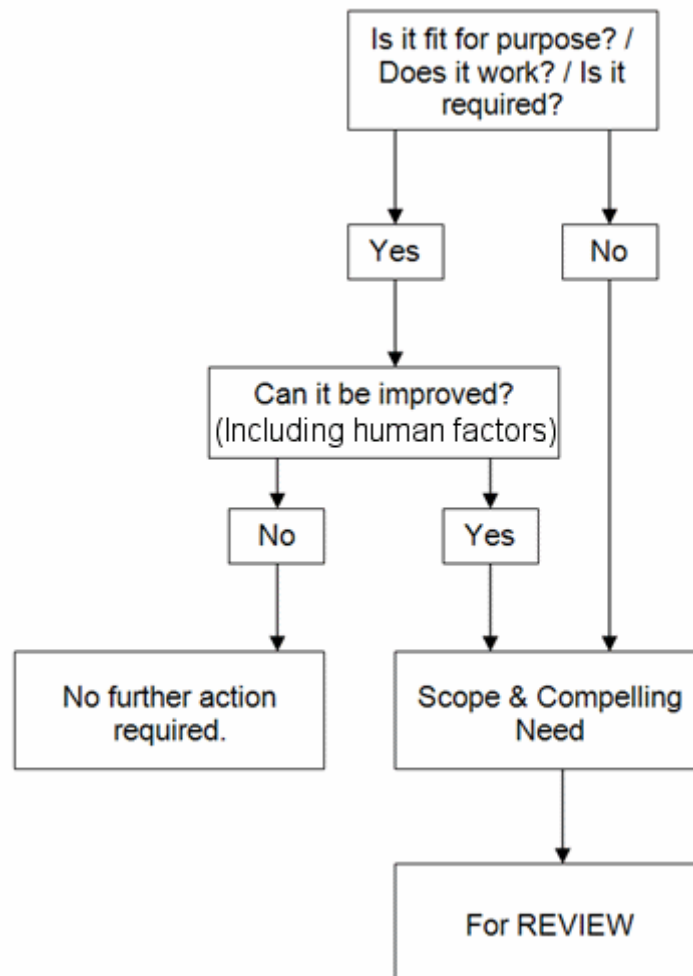
Action requested of the Sub-Committee

- 25 The Sub-Committee is invited to consider the proposal and to decide to include the proposed unplanned output "Revision and modernization of the Global Maritime Distress and Safety System" in the biennial agenda of the COMSAR Sub-Committee and in the provisional agenda for COMSAR 17.

Appendix A

REVIEW PROCESS

A simple process for the review is offered in the following flow diagram. The intent is to develop a simple statement of compelling need and implications for each of the review subjects.



* * *

Appendix B

CHECKLIST FOR CONSIDERING HUMAN ELEMENT ISSUES BY IMO BODIES

Instructions: If the answer to any of the questions below is: (A) YES , the preparing body should provide supporting details and/or recommendation for further work. (B) NO , the preparing body should make proper justification as to why human element issues were not considered. (C) NA (Not Applicable), the preparing body should make proper justification as to why human element issues were not considered applicable.	
Subject Being Assessed: (e.g. Resolution, Instrument, Circular being considered) Revision and modernization of the GMDSS	
Responsible Body: (e.g. Committee, Sub-committee, Working Group, Correspondence Group, Member State) Sub-Committee on Radiocommunications and Search and Rescue (COMSAR), and Sub-Committee on Standards of Training and Watchkeeping (STW) (Human element aspect)	
1. Was the human element considered during development or amendment process related to this subject?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
2. Has input from seafarers or their proxies been solicited?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
3. Are the solutions proposed for the subject in agreement with existing instruments? (Identify instruments considered in comments section)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA
4. Have human element solutions been made as an alternative and/or in conjunction with technical solutions?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
5. Has human element guidance on the application and/or implementation of the proposed solution been provided for the following:	
• Administrations?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
• Shipowners/managers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
• Seafarers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
• Surveyors?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
6. At some point, before final adoption, has the solution been reviewed or considered by a relevant IMO body with relevant human element expertise?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
7. Does the solution address safeguards to avoid single person errors?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
8. Does the solution address safeguards to avoid organizational errors?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
9. If the proposal is to be directed at seafarers, is the information in a form that can be presented to and is easily understood by the seafarer?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
10. Have human element experts been consulted in development of the solution?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
11. HUMAN ELEMENT: Has the proposal been assessed against each of the factors below?	
<input type="checkbox"/> CREWING. The number of qualified personnel required and available to safely operate, maintain, support, and provide training for system.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
<input type="checkbox"/> PERSONNEL. The necessary knowledge, skills, abilities, and experience levels that are needed to properly perform job tasks.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
<input type="checkbox"/> TRAINING. The process and tools by which personnel acquire or improve the necessary knowledge, skills, and abilities to achieve desired job/task performance.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
<input type="checkbox"/> OCCUPATIONAL HEALTH AND SAFETY. The management systems, programmes, procedures, policies, training, documentation, equipment, etc., to properly manage risks.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
<input type="checkbox"/> WORKING ENVIRONMENT. Conditions that are necessary to sustain the safety, health, and comfort of those on working on board, such as noise, vibration, lighting, climate, and other factors that affect crew endurance, fatigue, alertness and morale.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA

<input type="checkbox"/> HUMAN SURVIVABILITY. System features that reduce the risk of illness, injury, or death in a catastrophic event such as fire, explosion, spill, collision, flooding, or intentional attack. The assessment should consider desired human performance in emergency situations for detection, response, evacuation, survival and rescue and the interface with emergency procedures, systems, facilities and equipment.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
<input type="checkbox"/> HUMAN FACTORS ENGINEERING. Human-system interface to be consistent with the physical, cognitive, and sensory abilities of the user population.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
<p>Comments: (1) Justification if answers are NO or Not Applicable. (2) Recommendations for additional human element assessment needed. (3) Key risk management strategies employed. (4) Other comments. (5) Supporting documentation.</p> <p>3 – It is anticipated that certain existing instruments will need to be revised.</p>	

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Appendix C

PROPOSED PLAN OF WORK FOR THE GMDSS MODERNIZATION PROJECT

Coordinated Timeline and Planned Outputs for the IMO GMDSS Modernization Project				
Y	Q	Meeting	Output	Year deliverable
2012	2	MSC 90	Approval of Work Plan, along with a new unplanned output on the "Revision and modernization of the GMDSS" Coordination meeting of Chairmen of COMSAR, NAV, STW, and Secretariat	First draft of High-level review completed
	2		Correspondence Group begins GMDSS Review in preparation for COMSAR 17	
	3	NAV 58	Provide contributions from e-navigation perspective	
	3		Correspondence Group provides interim its report to JEG 8	
	4	19th ICAO/IMO Joint Working Group on SAR (JWG 19)	Reviews the report of COMSAR 16 and, in particular, the Work Plan and provides recommendations in relation to the High level review to COMSAR 17	
	4	8th Joint IMO/ITU Experts Group (JEG 8)	Reviews the interim report of the Correspondence Group and the outcome of NAV 58 and provides reports recommendations to Correspondence Group and COMSAR 17	
4	MSC 91	Coordination meeting of Chairmen of COMSAR, NAV, STW, and Secretariat		
2013	1		Correspondence Group reports to COMSAR 17	<ul style="list-style-type: none"> • First draft of High-level review discussed by COMSAR 17
	1	COMSAR 17	Continues GMDSS review, taking into account contributions of Correspondence Group, NAV 58, JWG 19 and JEG 8 and completes the High level review Re-establish Correspondence Group to prepare relevant input for COMSAR 18	
	1	STW 44	Reviews report of COMSAR 17 and MSC 90 Provide contributions from STCW and human element perspective	
	2	MSC 92	Coordination meeting of Chairmen of COMSAR, NAV, STW, and Secretariat	
	3	NAV 59	Reviews report of COMSAR 17 Provide contributions from e-navigation perspective	<ul style="list-style-type: none"> • Draft High-level review completed and First outline of the detailed review
	3		Correspondence Group provides interim report to JEG 9	
	3	JEG 9	Reviews the interim report of the Correspondence Group and the outcome of NAV 59 and provides recommendations to Correspondence Group and COMSAR 18	
	4	JWG 20	Reviews report of COMSAR 17 and provides recommendations to COMSAR 18	

Coordinated Timeline and Planned Outputs for the IMO GMDSS Modernization Project				
Y	Q	Meeting	Output	Year deliverable
2014	1		Correspondence Group reports to COMSAR 18	<ul style="list-style-type: none"> • High-level review approved by COMSAR 18 • Draft detailed review completed
	1	STW 45	Reviews report of COMSAR 17 Provide contributions from STCW and human element perspective	
	1	COMSAR 18	Continues GMDSS review taking into account reports of Correspondence Group, NAV 59, JEG 9, JWG 20 and STW 45 Re-establish Correspondence Group to prepare relevant input for COMSAR 19	
	2	MSC 93	Coordination meeting of Chairmen of COMSAR, NAV, STW, and Secretariat	
	3	NAV 60	Reviews report of COMSAR 18 Provide contributions from e-navigation perspective	
	3		Correspondence Group provides interim report to JEG 10	
	3	JEG 10	Reviews the interim report of the Correspondence Group and the outcome of NAV 60 and provides recommendations to Correspondence Group and COMSAR 19	
	4	JWG 21	Reviews report of COMSAR 18 and provides recommendations to COMSAR 19	
	4	MSC 94	Coordination meeting of Chairmen of COMSAR, NAV, STW, and Secretariat	
2015	1		Correspondence Group reports to COMSAR 19	<ul style="list-style-type: none"> • Detailed review endorsed by COMSAR 19 and approved by MSC 95 • First outline of the Modernization Plan
	1	STW 46	Reviews report of COMSAR 18 Provide contributions from STCW and human element perspective	
	1	COMSAR 19	Completes the GMDSS review, taking into account contributions of Correspondence Group, NAV 60, JEG 10, JWG 21 and STW 46, and begins to discuss the development of the GMDSS Modernization Plan Re-establish Correspondence Group to prepare relevant input for COMSAR 20	
	2	MSC 95	Reviews report of COMSAR 19 and approves (1) the outcome of the GMDSS review and (2) the continuation of the project in developing the Modernization Plan Coordination meeting of Chairmen of COMSAR, NAV, STW, and Secretariat	
	3	NAV 61	Reviews report of COMSAR 19 and MSC 95 Provide contributions from e-navigation perspective	
	3		Correspondence Group provides interim report to JEG 11	
	3	JEG 11	Reviews the interim report of the Correspondence Group and NAV 61 and provides recommendations to Correspondence Group and COMSAR 20	
	4	JWG 22	Reviews report of COMSAR 19 and provides recommendations to COMSAR 20	

Coordinated Timeline and Planned Outputs for the IMO GMDSS Modernization Project				
Y	Q	Meeting	Output	Year deliverable
2016	1		Correspondence Group reports to COMSAR 20	<ul style="list-style-type: none"> • Draft Modernization Plan completed
	1	STW 47	Reviews report of COMSAR 19 and MSC 95 Provide contributions from STCW and human element perspective	
	1	COMSAR 20	Continues development of GMDSS Modernization Plan, taking into account reports of MSC 95, Correspondence Group, NAV 61, JEG 11, JWG 22 and STW 47 Re-establish Correspondence Group to prepare relevant input for COMSAR 21	
	2	MSC 96	Coordination meeting of Chairmen of COMSAR, NAV, STW, and Secretariat [Human Element Working Group]	
	3	NAV 62	Reviews report of COMSAR 20 Provide contributions from e-navigation perspective	
	3		Correspondence Group provides interim report to JEG 12	
	3	JEG 12	Reviews interim report of the Correspondence Group and NAV 62 and provides recommendations to the Correspondence Group and COMSAR 21	
	4	JWG 23	Reviews report of COMSAR 20 and provides recommendations to COMSAR 21	
	4	MSC 97	Coordination meeting of Chairmen of COMSAR, NAV, STW, and Secretariat Human Element Working Group	
2017	1		Correspondence Group reports to COMSAR 21	<ul style="list-style-type: none"> • Modernization Plan endorsed by COMSAR 21 and approved by MSC 98
	1	STW 48	Reviews report of COMSAR 20 Provide contributions from STCW and human element perspective	
	1	COMSAR 21	Completes GMDSS Modernization Plan taking into account reports of Correspondence Group, NAV 62, JEG 12, JWG 22 and STW 47 Provides Final Report to MSC 98	
	2	MSC 98	Reviews report of COMSAR 21 Acts on Final GMDSS Modernization Plan	

ANNEX 2

**TERMS OF REFERENCE FOR THE CORRESPONDENCE GROUP
ON THE REVIEW OF THE GMDSS**

After the approval by MSC 90 (16 to 25 May 2012) of the Work Plan and the new unplanned output on the "Revision and modernization of the Global Maritime Distress and Safety System" for the COMSAR Sub-Committee, and the inclusion of this agenda item on the agenda of COMSAR 17, the Correspondence Group on the Review of the GMDSS, taking into account the approved Work Plan, should:

- .1 develop, in particular, the draft High-level review of the GMDSS; and
- .2 submit its report by Friday, 21 September 2012, to the Joint IMO/ITU Experts Group (8 to 12 October 2012) for its consideration and finalization of the draft High-level review of the GMDSS for submission to COMSAR 17.

ANNEX 3

DRAFT MSC CIRCULAR

GUIDANCE TO PROSPECTIVE GMDSS SATELLITE SERVICE PROVIDERS

1 The Maritime Safety Committee, at its [ninetieth session (16 to 25 May 2012)], approved the attached Guidance to prospective GMDSS satellite service providers, prepared by the Sub-Committee on Radiocommunications and Search and Rescue, at its sixteenth session.

2 The purpose of this circular is to provide guidance with respect to the provisions of resolution A.1001(25) on Criteria for the provision of mobile satellite communication systems in the Global Maritime Distress and Safety System (GMDSS).

3 Member Governments are invited to bring this Guidance to the attention of all parties concerned.

ANNEX

GUIDANCE TO PROSPECTIVE GMDSS SATELLITE SERVICE PROVIDERS

INTRODUCTION

1 Assembly resolution A.1001(25) provides the adopted criteria for the provision of mobile satellite communication systems in the Global Maritime Distress and Safety System (GMDSS) and requests the Maritime Safety Committee to:

- (a) apply the criteria set out in the annex to the present resolution, through the procedure set out in section 2 of the annex, to evaluate satellite systems notified by Governments for possible recognition for use in the GMDSS, within the context of the relevant regulations of SOLAS chapter IV; and
- (b) ensure that mobile satellite communication systems recognized by the Organization for use in the GMDSS are compatible with all appropriate SOLAS requirements, and also that such recognition takes into account existing operational procedures and equipment performance standards.

2 The Maritime Safety Committee, at its eighty-eighth session agreed on the need to further study the implementation of the concept of regional satellite systems in the GMDSS and instructed the COMSAR Sub-Committee to consider the matter under its agenda item "Scoping exercise to establish the need for a review of the elements and procedures of the GMDSS". As a result, the COMSAR Sub-Committee developed this Guidance to prospective GMDSS satellite service providers with respect to the provisions of resolution A.1001(25).

BACKGROUND

3 Section 2 of Assembly resolution A.1001(25) provides information and guidance on the recognition for mobile satellite communications systems for use in the GMDSS. It includes some key provisions, as follows:

- .1 The evaluation and recognition of satellite systems participating, or wishing to participate in the GMDSS are undertaken by the Organization;
- .2 Satellite system providers wishing to participate in the GMDSS should apply to the Organization, through a Member State;
- .3 Such applications should be notified to the Organization by Governments;
- .4 The application will be reviewed by the Maritime Safety Committee (the Committee);
- .5 If the Committee decides that there are no objections in principle to the application, it will forward the application to the COMSAR Sub-Committee for evaluation;
- .6 Recognition of the satellite provider to operate in the GMDSS will be undertaken by the Committee on the basis of the evaluation report;

- .7 The Governments concerned should make available to the Organization all necessary information to enable it to evaluate the satellite system in relation to the criteria;
 - .8 Governments proposing such satellite systems for possible recognition and use in the GMDSS should provide evidence to show that:
 - .1 the satellite system conforms with all the criteria specified in (resolution A.1001(25));
 - .2 the charging policies and provisions of resolution A.707(17), as amended, on Charges for distress, urgency and safety messages through the Inmarsat system, are complied with;
 - .3 there is a well-founded confidence that the company concerned will remain viable for the foreseeable future, that the company has a well-organized quality and risk management programme, and that the company will remain in a position to deliver the required services over an extended period; and
 - .4 the provider of the satellite system is ready to submit any recognized services to oversight by IMSO and sign the required Public Services Agreement (PSA) with that organization; and
 - .9 The COMSAR Sub-Committee should verify and evaluate the information, seeking clarification as required direct from the service provider concerned, and decide whether the satellite system meets the criteria established by resolution A.1001(25).
- 4 The main questions requiring additional guidance to these provisions of resolution A.1001(25) are:
- .1 What constitutes: "... all necessary information ...";
 - .2 Must a satellite system offer full global coverage in order to be considered for participation in the GMDSS;
 - .3 Should the proposing Government(s) accept responsibility for the accuracy and completeness of the information provided;
 - .4 On what basis can the proposing Government(s) and the Organization establish "... a well-founded confidence that the company concerned will remain viable for the foreseeable future ...";
 - .5 How does the COMSAR Sub-Committee undertake its evaluation and produce an evaluation report; and
 - .6 How can the evaluation and recognition process be accomplished within a timescale that coincides with the commercial realities of successful and proper Company administration and management?

These questions are addressed in the following paragraphs:

WHAT CONSTITUTES: "... ALL NECESSARY INFORMATION ..."?

5 The information and evidence that will be necessary for a full and comprehensive evaluation of any submission to be carried out is very wide-ranging and quite detailed. Experience of designing, implementing and operating the present satellite-based elements of the GMDSS, and evaluating their initial and continuing operational and other capabilities, has shown that it will not be sufficient, for example, to accept a plain statement such as: "the system can deliver a distress alert to an RCC within 60 seconds of it being originated". In such a case, in order to provide an assurance to the Committee that the candidate system will meet this target reliably on a high percentage of occasions, the evaluation would need to take into account such diverse factors as:

- .1 Spectrum: frequency band; type of allocation; reliability of signalling in this band; etc.
- .2 Constellation: number and arrangement of satellites; link budget; number of on-orbit spares required and provided; inter-satellite hand-offs; etc.
- .3 Ground segment: number and geographical disposition of ground stations, satellite and communication network control arrangements; contingency arrangements in the event of satellite or network failures; availability; time of contingency service restoration; communication links to RCCs; distress alert distribution arrangements; message prioritization; personnel availability, shift patterns, training; etc.
- .4 Mobile terminals: design, manufacture and market availability; test procedures and type approval, IEC compliance; capabilities; signalling modes and protocols; ship installation guidelines and arrangements; etc.
- .5 Live end-to-end system and contingency tests.
- .6 Availability, performance and arrangement comparable to existing GMDSS satellite services, including Maritime Safety Information.

This list is not fully comprehensive. However, it serves to illustrate the complexity of the consideration when evaluating submissions from potential additional satellite system providers for participation in the GMDSS under the requirements of resolution A.1001(25).

MUST A SATELLITE SYSTEM OFFER FULL GLOBAL COVERAGE IN ORDER TO BE CONSIDERED FOR PARTICIPATION IN THE GMDSS?

6 According to section 1.3 of resolution A.1001(25), the Coverage Area of the satellite system is the geographical area within which the satellite system provides an availability in accordance with the criteria stated in section 3.5 in the ship-to-shore and shore-to-ship directions, and within which continuous alerting is available. Section 3.5, dealing with availability, states among others that the satellite system should provide continuous availability for maritime distress and safety communications in the ship-to-shore and shore-to-ship directions.

If the system(s) which a ship is licensed to use does not offer full global coverage, Administrations will need to devise a means of matching the ship's distress and safety radio capabilities with the regions of the world in which she is permitted to operate.

In this context, it is important to note that satellite systems forming part of the GMDSS should provide capabilities for all the nine maritime distress and safety communications functions specified by chapter IV, regulation 4.

SHOULD THE PROPOSING GOVERNMENT(S) ACCEPT RESPONSIBILITY FOR THE ACCURACY AND COMPLETENESS OF THE INFORMATION PROVIDED?

7 Individual proposing Member States are unlikely to be able to endorse technical, operational and financial statements made by a potential satellite system provider for the GMDSS, as required by paragraph 2.2.2 of the annex to resolution A.1001(25), to the breadth and depth necessary for the Committee to reach an informed decision on an application.

8 With this in mind, the COMSAR Sub-Committee should be provided with an in-depth Technical and Operational Assessment report, on which to base its evaluation and any recommendation to the Committee.

9 The universal credibility of the Technical and Operational Assessment will require that any applicant satellite communications system operator provides hard, incontrovertible evidence, including suitable metrics wherever appropriate, in support of its application. Although the sufficiency and accuracy of the evidence provided should be assured by the submitting Member State(s) before any such application is forwarded for consideration by the Committee, it is likely that both the Company and Member State representatives will need to discuss the evidence and liaise with those conducting the Assessment before the evidential submission is completed.

ON WHAT BASIS CAN THE PROPOSING GOVERNMENT(S) AND THE ORGANIZATION ESTABLISH "... A WELL-FOUNDED CONFIDENCE THAT THE COMPANY CONCERNED WILL REMAIN VIABLE FOR THE FORESEEABLE FUTURE ..."?

10 The evaluation of a potential applicant company in relation to the requirement that "there is a well-founded confidence that the company concerned will remain viable for the foreseeable future and will remain in a position to deliver the required services over an extended period" poses particular difficulties. Financial regulations and laws in many countries prevent companies from making the kind of forward-looking statements that could assist the Committee in this regard, and any publicly owned company is entirely subject to the vagaries of the stock markets. Therefore, it is recommended that the proposing government(s) should be the only entity(ies) that should make a statement to the Committee in relation to this requirement, and such a statement might probably only be phrased in terms of the requirement itself. For instance, it could be stated that the provider has been providing services for [...] years, is a going concern, and that there is no reason to believe that the provider would not be able to continue to do so.

HOW DOES THE COMSAR SUB-COMMITTEE UNDERTAKE ITS EVALUATION AND PRODUCE AN EVALUATION REPORT?

11 Given the complexity of the Technical and Operational Assessment, the technical and operational experience required, the probable need for a dialogue between the assessors and the company concerned, and the time required to achieve a sufficient understanding of all the factors affecting the probable performance of an applicant satellite system, the Technical and Operational Assessment report used to inform COMSAR's evaluation could be produced by an independent body which can report directly to the COMSAR Sub-Committee. IMSO would need to undertake that work in any case, in order for it to acquire the system-specific knowledge necessary for it to be able to oversee the

performance of any successful applicant satellite system, once it is approved for participation in the GMDSS. It is, therefore, expected that the Committee would request IMSO to undertake the Technical and Operational Assessment and produce the report.

HOW CAN THE EVALUATION AND RECOGNITION PROCESS BE ACCOMPLISHED WITHIN A TIMESCALE THAT COINCIDES WITH THE COMMERCIAL REALITIES OF SUCCESSFUL AND PROPER COMPANY ADMINISTRATION AND MANAGEMENT?

12 Given that resolution A.1001(25) establishes that the application and decision are matters for the Committee, and evaluation is to be done by the COMSAR Sub-Committee, the procedure cannot be accomplished in less than one year. Some specimen processes are summarized in the following table:

YEAR			Worst Case	Fast Track A	Fast Track B
1	Mar	COMSAR			
	May	MSC	Application		
	Nov	MSC		Application	
2	Mar	COMSAR	Evaluation	Evaluation + Report	
	May	MSC		Decision + MSC Resolution	Application
	Nov	ASSEMBLY			
3	Mar	COMSAR	Report		Evaluation + Report
	May	MSC	Decision		Decision + MSC Resolution
	Nov	MSC			

The table shows that, in the Worst Case, it could be possible for the review, evaluation and decision procedure to take up to two and a half years, even without any need to revert to the applicant with a request for further detail or explanation. This would be extremely likely to deter potential commercial satellite system operators from applying to become involved in the GMDSS. The Fast Track requires that the COMSAR Sub-Committee undertake the evaluation and complete its report in one session, and that the evaluation report and recommendation are sent to the next session of the Committee for consideration as an Urgent Matter. The Fast Track takes either 12 or six months depending on whether the application is made in an Assembly year or not. It may be concluded that Fast Track A is unlikely to be achieved.
