Original 8/31/05 Ed Gilbert

DRAFT AMENDMENTS
to
IMO RESOLUTION A.888 (21)
adopted on 25 November 1999

CRITERIA FOR THE PROVISION OF MOBILE-SATELLITE COMMUNICATION SYSTEMS IN THE GLOBAL MARITIME DISTRESS AND SAFETY SYSTEM (GMDSS)

THE ASSEMBLY,

RECALLING Article 15(j) of the Convention of the International Maritime Organization concerning the functions of the Assembly in relation to regulations and guidelines concerning maritime safety,

RECALLING ALSO that regulation IV/5 of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended in 1988, requires each Contracting Government to undertake to make available, either individually or in co-operation with other Contracting Governments, as they may deem practical and necessary, appropriate shore-based facilities for space and terrestrial radiocommunication services having due regard to the recommendations of the Organization,

TAKING INTO ACCOUNT resolution 322(Rev.Mob-87) of the World Administrative Radio Conference, 1987, relating to coast stations and coast earth stations assuming watchkeeping responsibilities on certain frequencies in connection with the implementation of distress and safety communications for the GMDSS,

TAKING INTO ACCOUNT ALSO resolution 3, Recommendation on the Early Introduction of the Global Maritime Distress and Safety System (GMDSS) Elements, adopted by the 1988 SOLAS Conference introducing the GMDSS,

NOTING resolution A.801 (19) on the Provision of radio services for the GMDSS,

NOTING ALSO, that several mobile-satellite communication systems might have the potential to offer maritime distress and safety communications,

RECOGNISING that mobile-satellite communication systems for use in the GMDSS should fulfil performance criteria adopted by the Organization,

RECOGNIZING ALSO the need for the Organization to have in place procedures and criteria against which to evaluate the capabilities and performance, of mobile-satellite communication systems, as may be notified to the Organization by Governments for possible recognition for use in the GMDSS;

1. ADOPTS the Criteria for the Provision of Mobile-Satellite Communication Systems in the GMDSS set out in the Annex to the present resolution;

2. INVITES Governments, when permitting ships flying their countries' flag to carry maritime mobile satellite equipment for use in the GMDSS to require those ships to carry equipment which can utilize satellite systems that have been recognised by the Organization for use in the GMDSS, in accordance with the criteria set out in sections 2 to 5 of the Annex;

3. REQUESTS the Maritime Safety Committee to:

(a) apply the criteria set out in the Annex to the present resolution, in particular the procedure set out in section 1 of the Annex, when evaluating mobile-satellite communication systems notified by Governments for possible recognition for use in the GMDSS, and to consider, in connection with decisions thereon, the provisions of relevant regulations of SOLAS chapter IV;

(b) keep this resolution under review and take appropriate action as necessary to secure the long-term integrity of the GMDSS.

ANNEX

CRITERIA FOR THE PROVISION OF MOBILE-SATELLITE COMMUNICATION SYSTEMS IN THE GLOBAL MARITIME DISTRESS AND SAFETY SYSTEM (GMDSS)

1 DEFINITIONS

1.1 Mobile Satellite Communication System

The mobile satellite communication system means the space segment, the arrangements for controlling the space segment, the network control facilities controlling the access to the space segment, the earth stations and maritime mobile terminals operating in the system. The mobile satellite communication system will include, or interface with, the following elements:

.1 Earth station means any fixed satellite communication station acting as a gateway between the space segment and the terrestrial networks.

.2 Maritime mobile terminal means any radiocommunication equipment working through a mobile satellite communication system recognised for use in the GMDSS on board a ship.

.3 Space segment means the satellites and the radiocommunication facilities they carry both for control and to provide GMDSS services and includes the forward and return communication links with the earth.

.4 Terrestrial networks means the communication networks providing land-based subscriber communication facilities such as telephone, facsimile or data communications.

1.2 Mobile Satellite Communication Service means any service, which operates through a mobile satellite communication system and is recognised by IMO for use in the GMDSS.

1.3 Coverage area

The Coverage Area of the mobile satellite communication system is the geographical area within which the satellite system provides availability in accordance with the criteria stated in section 3.5 in the ship-to-shore and shore-to-ship directions, and where continuous alerting is available.

1.4 Availability

The availability of ~~a~~ any mobile satellite communication system or service is defined as the percentage of time in which the system or service as a whole is available for access to and communications through the system, calculated according to the following formula:

$$A = \frac{\text{(scheduled operating time) - (downtime)}}{\text{(scheduled operating time)}} \times 100\%$$

where:

Scheduled operating time *= 100% of the time period being reported on; and*

Downtime *= the total time during the period for which the recognised GMDSS system or service was not operationally available.*

Note: Definitions and calculations of availabilities of communications circuits in the Maritime Mobile-Satellite Service are given in ITU-R *M.828-1.*

2 RECOGNITION OF MOBILE SATELLITE COMMUNICATION SYSTEMS FOR USE IN THE GMDSS

2.1 Mobile-satellite communication systems wishing to participate in the GMDSS should apply to the Organization, through a Member State. Governments should notify such applications to the Organization, either individually or in co-operation with other Governments. The Governments concerned should make available to the Organization all necessary information to enable the Organization to evaluate the system in relation to the criteria indicated below.

2.2 Governments proposing such mobile-satellite communication systems for possible recognition and use in the GMDSS should provide evidence to show that:

.1 the mobile satellite communication systems conforms with all the criteria specified in this Annex;

.2 the provisions of resolution A.707 (17) on Charges for distress, urgency and safety messages through the Inmarsat system are complied with, and

.3 if the government will provide oversight for the system

.4 if the government selects the International Maritime Satellite Organization (IMSO) as the oversight organization, necessary arrangements have been made for IMSO to provide the oversight.

2.3 Notifications of mobile satellite communication systems proposed for evaluation and possible recognition for use in the GMDSS should be submitted to the Maritime Safety Committee, which will forward the application and all supporting data to COMSAR for evaluation. COMSAR will evaluate the information and report to the Maritime Safety Committee (MSC), normally at its next session, with a recommendation as to whether the mobile-satellite communication system meets the requirements stated in this resolution. The Maritime Safety Committee will review the recommendation of COMSAR and decide as appropriate, taking into account the provisions of the relevant regulations of chapter IV of the 1974 SOLAS Convention, as amended and the requirements of this resolution. Recognition by the Maritime Safety Committee will be recorded in an MSC resolution, which states, *inter alia*, the name of the company providing the recognised services and a detailed unique description of the services, which have been recognized.

2.4 Reports and continuing review

2.4.1 Governments recommending mobile satellite communications that have been recognized for use in the GMDSS shall at least once a year, make available to the Organization for evaluation a report on the availability, performance and other relevant information concerning each recognised service during the period since the preceding report in accordance with the criteria indicated below.

2.4.2 In those cases where IMSO is chosen as the oversight organization, it shall submit similar reports.

2.4.3 The Organization should include and maintain in the GMDSS Master Plan details of all areas covered by mobile-satellite communication systems recognized for use in the GMDSS. The Organization should periodically circulate an updated copy of the description of these systems and areas to Governments.

3 CRITERIA AND REQUIREMENTS FOR THE RECOGNISED MOBILE-SATELLITE COMMUNICATION SYSTEM

3.1 Functional requirements*

* - Resolution A.801 (19) "Provision of Radio Services for the Global Maritime Distress and Safety System (GMDSS)", Annex 5 "Criteria for use when providing Inmarsat shore-based facilities for use in the GMDSS";
- Resolution A.887 (21) "Establishment, Updating and Retrieval of the Information Contained in the Registration Databases for the Global Maritime Distress and Safety System (GMDSS)";
- Resolution A.694 (17) "General requirements for shipborne radio equipment forming part of the Global Maritime Distress and Safety System (GMDSS) and for electronic navigational aids";
- IMO International SafetyNET Manual;
- Resolution A.664 (16) "Performance Standards for Enhanced Group Call Equipment"; and
- Appropriate IEC Standards and ITU Recommendations.

Mobile-satellite communication systems for maritime distress and safety communication services and forming part of the GMDSS radio systems specified in chapter IV, regulation 5 of the 1974 SOLAS Convention, as amended, shall be capable of processing at least one the following maritime distress and safety communications:

.1 ship-to-shore distress alerts/calls;

.2 shore-to-ship distress relay alerts/calls;

.3 ship-to-shore, shore-to-ship and ship-to-ship search and rescue co-ordinating communications;

.4 ship-to-shore transmissions of Maritime Safety Information;

.5 shore-to-ship broadcast of Maritime Safety Information; and

.6 ship-to-shore, shore-to-ship, and ship-to-ship general communications.

3.2 Capacity

The satellite system should be designed for and should provide adequate channel and power capacity for processing effectively, and with an availability as stated in section 3.5, the maritime distress, urgency, safety and general communication traffic estimated to be required by the ships using the system.

3.3 Priority access

3.3.1 Mobile satellite communication systems in the GMDSS shall be capable of processing maritime distress, urgency, safety and routine communications in accordance with the message priority as defined by the ITU Radio Regulations. The order of processing these communications should be:

.1 distress;

.2 urgency;

.3 safety; and

.4 routine (general communications).

3.3.2 In implementing these four levels of priority:

.1 Distress alerts and distress calls (level 1) shall be given priority treatment by providing immediate access to satellite channels. For store and forward systems, distress alerts and calls should be placed ahead of all other traffic.

.2 Mobile satellite communication systems used for providing other mobile-satellite communications in addition to maritime communications should be capable of automatically recognizing requests for maritime communications from:

- **maritime mobile terminals; and**

- **recognized entities of critical importance for safety at sea, such as MRCCs, hydrographic and meteorological offices, medical centres, etc., registered with the earth station**

The system should process such maritime communications in the ship-to-shore and shore-to-ship directions for levels 1 to 3 with priority over other communications.

.3 In processing maritime distress, urgency, safety and routine communications, the satellite system and the earth station should be capable of:

.1 automatically recognizing the message or access priority for ship-to-shore communications;

.2 automatically recognizing the message or access priority for shore-to-ship communications from, as a minimum, recognized entities of importance for safety at sea, registered by the earth station;

.3 preserving and transferring the priority;

.4 giving distress alerts and distress calls immediate access;

.5 automatically recognizing maritime distress communications, and of routeing automatically maritime distress alerts and distress calls directly to the associated MRCC, or responsible RCC if this capability exists; and

.6 processing maritime urgency and safety communications in the ship-to-shore and shore-to-ship directions with the required priority, for example by allocating the first vacant channel, if no channel is immediately available.

.4 Selection and use of message or access priority for urgency and safety transmissions by maritime mobile terminals should be automatic and should be restricted to calls to special, recognized entities such as medical centres, maritime assistance, hydrographic and meteorological offices, etc., registered with the earth station. The earth station should automatically route such calls directly to the relevant entity.

3.4 Coverage area

3.4.1 The definition of the Coverage Area is given in section 1.

3.4.2 The Coverage Area is to be delineated on a map and also described in relation to the sea areas defined in Chapter IV regulation 2 of the SOLAS Convention.

3.4.3 Information on coverage areas for satellite systems accepted by the Organization, as forming part of the GMDSS, should be published by the Organization in the GMDSS Master Plan.

3.5 Availability

3.5.1 The satellite system should provide continuous availability for maritime distress and safety communications in the ship-to-shore and shore-to-ship directions.

3.5.2 The availability of the space segment, provision of spare satellite capacity and the network control function (i.e. the network availability), as defined in section 1.4 above, should be monitored by oversight organization, which will report on the recorded availability of the system to the Organization at least once every year. Service providers are required to advise their associated RCCs and the oversight organization of planned outages of recognised services and advise ships of scheduled downtime and known interruptions in service and any other relevant network information.

> **5.3 Network availability. The complete mobile satellite communication network, including earth stations is expected to achieve at least 99.9% availability. (equivalent to 8.8 hours down time per year)**

3.6 Restoration and spare satellites

3.6.1 Spare satellite capacity and arrangements prepared in advance shall be provided for ensuring, in the event of a partial or total satellite failure, the recognised maritime distress and safety communication services can be restored in the area concerned to their normal availability, within no more than one hour after the event of a satellite failure.

3.6.2 Full information on the means and arrangements prepared for restoration of the maritime distress and safety communication services in the event of a satellite failure should be notified to the Organization. The Company and the oversight organization shall conduct exercises from time to time to prove the efficiency and effectiveness of these planned arrangements.

3.7 Identification

The satellite system shall be capable of automatically recognizing and preserving the identification of maritime mobile earth stations.

3.8 Information to be made available to SAR authorities

For all distress urgency and safety communications, the maritime mobile terminal identification number or Maritime Mobile Service Identity (MMSI) should be an integral part of the distress alert and provided to the RCC with the alert. When available, all additional registration, commissioning or other data relevant to the search and rescue or prosecution of false alert should be referenced to this number and made available to the proper SAR authority or RCC upon request.

3.9 Reception of distress alerts

The satellite system should allow for addressing a maritime distress alert to a specific MRCC chosen by the ship's operator and covering the area concerned, but should also provide for automatic routeing of manually initiated maritime distress alerts. Means should be provided to allow the MRCC to easily establish shore-to-ship communications with any ship, which has originated a distress alert or other maritime priority message.

3.10 Control of maritime mobile terminals

Access control arrangements for controlling and giving, or temporarily rejecting, access for maritime mobile terminals to the system shall at all times allow maritime mobile terminals access for transmission of maritime distress alerts/calls and distress messages.

3.11 Test facilities

The system should provide facilities making it possible for maritime mobile terminals to test the distress capability of their stations without initiating a distress alert/call.

4 CRITERIA AND REQUIREMENTS FOR EARTH STATIONS

4.1 Functional requirements

4.1.1 Earth stations serving the GMDSS should:

.1 be in continuous operation;

.2 be connected to an associated RCC;

.3 keep continuous watch on all appropriate satellite communication channels; a

.4 be capable of transmission and reception of at least the maritime distress and safety communications services included in paragraph 3.1.1.

4.2 Priority

4.2.1 The earth station should be capable of automatically recognizing the priority of ship-to-shore and shore-to-ship communications, and should preserve the priority and process maritime mobile communications with the four levels of priority specified in paragraph 3.3.1

4.2.2 Priority access should be given for distress alerts and calls in real time. In any case, distress alerts and calls should be given priority treatment by providing immediate access to satellite channels, and distress alerts and calls for store and forward systems should be placed ahead of all routine traffic. Any system designed for use in the GMDSS should be able to recognize the four levels of priority and give appropriate access for communications in the ship-to-shore direction and in the shore-to-ship direction for distress, urgency and safety traffic originated by RCCs or other Search and Rescue Authorities.

4.2.3 Limitations in existing public switched networks on facilities for indication and use of priority access codes might necessitate special arrangements such as use of leased lines between, for example, MSI providers and the earth station, until such facilities become available in the public switched network.

4.3 Assured access

4.3.1 Mobile satellite communication systems participating in the GMDSS should make arrangements to ensure that it will always be possible for an authorized shore authority to obtain an immediate connection to a maritime mobile terminal on demand.

4.4 Routeing of maritime distress alerts

4.4.1 The mobile satellite communication system must have reliable communication links to one or more associated MRCCs. These links may be implemented directly between the MRCC and an earth station, or some other suitable point in the system's network. The arrangements between the system and the MRCC are subject to approval by the national administration.

4.4.2 The system's network should be capable of automatically recognizing maritime distress and safety communications and of routeing, as far as possible automatically, the maritime distress alerts/calls directly to the associated MRCC, via a highly reliable communication link. In cases where capability exists, the system may route alerts directly to the responsible RCC as defined in the IAMSAR Manual.

4.4.3 The earth station or other relevant part of the system's network should be provided with an aural and visual alarm to alert a designated responsible person in the event that automatic connection to the MRCC cannot be achieved within 60 seconds. In this case, all necessary action shall be taken to immediately inform the MRCC of the details of the distress alert or call. Personnel shall always be available to react to such an alarm so as to ensure that the distress alert or call can be forwarded to an MRCC

within 5 minutes of the alarm being triggered. All messages with distress (level1) or urgency (level 2) priority shall sound an alarm at the earth station or other relevant part of the system's network, which must be cancelled manually.

4.4.4 The MRCC should be provided with reliable communication links to the system's network for efficient handling of shore-to-ship distress relay alerts and distress traffic, preferably via dedicated communication links.

4.5 Identification

The system should be capable of automatically identifying ship earth stations. If another identification than the Maritime Mobile Service Identity (MMSI) is used in the system, a means shall be provided to easily identify the ship, and to provide all the appropriate additional information, including the MMSI number where available, to the MRCC necessary for effecting the rescue.

4.6 Voice communication systems

4.6.1 The communication links for mobile-satellite voice communication systems should be connectable to the public switched network in accordance with relevant ITU-T Recommendations.

4.6.2 Mobile satellite communication systems using the public switched network for routeing maritime distress alerts/calls and distress traffic to and from MRCCs should, upon receipt of ship-to-shore or shore-to-ship distress alerts/calls or distress traffic, immediately attempt to establish the connection necessary for transfer of the distress alert or distress message.

4.7 Data communication systems

4.7.1 The communication links for mobile-satellite data communication systems should be connectable to the public data communication network in accordance with relevant ITU-T Recommendations. The system should provide capability for transfer of the identity of the called subscriber to the calling subscriber. Maritime distress alerts/calls and distress messages should include the ship identity and the earth station identity or other means of identifying the point of access to the satellite network.

4.7.2 Mobile satellite communication systems using the public switched network for routeing distress alerts/calls and distress traffic to and from MRCCs should, on receipt of ship-to-shore or shore-to-ship distress alerts/calls or distress traffic, immediately attempt to establish the connection necessary for transfer of the distress alert or distress message.

4.8 Store and forward systems

Mobile satellite communication systems using store and forward communication systems should:

.1 make an initial attempt to deliver a ship-to-shore or shore-to-ship message within 60 s for any maritime distress alert or distress traffic, and 10 min for all other maritime messages, from the time the receiving station receives the message. The message should include the ship identity and the earth station or system identity; and

.2 generate notification of non-delivery immediately once the message is considered non-deliverable, for maritime distress alerts and distress messages not later than 4 min after the reception of the alert or message.

4.9 Facilities for broadcast of Maritime Safety Information

4.9.1 Maritime mobile-satellite communication systems forming part of the GMDSS should technically be capable of offering facilities for broadcast of Maritime Safety Information (MSI) from MRCC's and authorized providers of MSI, such as Hydrographic Offices and Meteorological Offices, to ships at sea.

4.9.2 Such facilities for broadcast of MSI should provide for automatic, continuous and reliable reception on board ships and should, as a minimum, fulfil the requirements specified in sections 4.9.3 to 4.9.7 below.

4.9.3 The facilities should provide for recognition of and processing the four levels of priority specified in paragraph 3.3.1.

4.9.4 It should be possible to address the broadcast of MSI to all properly equipped ships within a specified area for at least the following types of areas:

.1 the entire region covered by the satellite or system over which the transmission is made;

.2 the NAVAREAs/METAREAs as established by the International Maritime Organization (IMO), the International Hydrographic Organization (IHO) and the World Meteorological Organization (WMO) respectively; and

.3 a temporary area chosen and specified by the originator of the MSI message, including circular or rectangular user-specified areas appropriate for broadcast of distress alerts relays and search and rescue co-ordinating communications.

4.9.5 The facilities should provide for transmission of at least the types of Maritime Safety Information required by SOLAS, as follows:

.1 search and rescue co-ordination information, including distress alerts relays;

.2 navigational warnings; and

.3 meteorological warnings and forecasts.

4.9.6 The facilities for broadcast of navigational and meteorological warnings should include possibilities for:

.1 scheduling the broadcast at fixed times or transmitting messages as unscheduled broadcast transmissions; and

.2 automatic repetition of the broadcast with time intervals and number of broadcast transmissions as specified by the MSI provider, or until cancelled by the MSI provider.

4.9.7 The facilities should provide for marking MSI messages with a unique identity, making it possible for the shipborne equipment for reception of these broadcasts to automatically ignore messages already received.

4.9.8 The broadcast service may in addition provide facilities for broadcasts similar to NAVTEX to coastal areas not covered by the International NAVTEX Service, in accordance with the identification system (*i.e.*, the identification characters B1, B2, B3, B4) used in the International NAVTEX Service.

5 ADDITIONAL RECOMMENDED CAPABILITIES

5.1 Mobile-satellite service providers are encouraged to:

.1 route Automatic Location Identification (ALI) and Automatic Number Identification (ANI) in accordance with appropriate ITU-T Recommendations with distress calls originating from MSS terminals directly to responsible RCCs for voice and data calls;

.2 automatically route information contained in registration databases in accordance with resolution A.887 (21) in a recognizable format with the distress call to the responsible RCC, once means are established for doing so;

.3 be capable of retrieving maritime safety information in a timely manner from NAVAREA, METAREA, other relevant co-ordinators, and the International Ice Patrol Service, in a standard format and process established by those co-ordinators; and

6 NOVEL TECHNIQUES

Mobile satellite communication systems may be permitted to use novel techniques to provide any of the capabilities required by this resolution. Approval to

use such novel techniques may be given provisionally by the oversight organization to allow early introduction and proper evaluation of the technique. The Maritime Safety Committee shall give final recognition of a novel technique.