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DEVELOPMENTS IN GMDSS SERVICES, INCLUDING GUIDELINES ON MARITIME SAFETY INFORMATION (MSI)

Proposed amendments to the Interim Iridium SafetyCast service manual

Submitted by the IHO World-Wide Navigational Warning Service Sub-Committee (WWNWS-SC) and the WMO Services Commission (SERCOM)

SUMMARY

Executive summary:	This document contains a proposal for amending the Interim Iridium SafetyCast service manual
Strategic direction, if applicable:	6
Output:	6.2
Action to be taken:	Paragraph 6
Related documents:	Resolutions MSC.468(101), MSC.469(101), MSC.470(101) and MSC.1/Circ.1613

Introduction

1 As part of its editorial review of all Maritime Safety Information (MSI) documentation, the IHO Sub-Committee on the World-Wide Navigational Warning Service (WWNWS-SC) has been reviewing the *Interim Iridium SafetyCast service manual* (MSC.1/Circ.1613), published on 14 June 2019. Further to the last meeting of the Sub-Committee, which was held remotely in September 2020, work on this review has now been completed. The WMO Services Commission (SERCOM) participated fully in the review. WWNWS-SC also received advice and guidance from the Secretariat of the International Maritime Organization (IMO).

Discussion

2 The review took into account the outcomes of MSC 101 and NCSR 7, particularly the recognition of the Iridium SafetyCast service as a mobile satellite service under the Global Maritime Distress and Safety System (GMDSS). The review was a result of the experiences

gained by Iridium and the NAVAREA and METAREA Coordinators during the test and evaluation processes which have been undertaken and remain ongoing.

3 In addition to the changes described above, the WWNWS-SC has taken the opportunity to add, revise and improve the texts to include reference to the recently established WMO SERCOM (to which the new Worldwide Met-Ocean Information and Warning Service Standing Sub-Committee (WWMIWS-SC) reports), the definition for the term Enhanced Group Call (EGC) and to include reference to the IMO Enhanced Group Call Coordinating Panel, which replaced the former International SafetyNET Coordinating Panel.

4 At the same time, the outcomes of MSC 101 have been included with cross-reference and harmonization with resolutions MSC.468(101) (resolution A.705(17), as amended), MSC.469(101) (resolution A.706(17), as amended), and MSC.470(101) (resolution A.1051(27), as amended), being undertaken.

5 Following endorsement by the IHO WWNWS-SC and the WMO SERCOM, the draft amended text of the Iridium SafetyCast service manual (MSC.1/Circ.1613) is now submitted to NCSR 8, as set out in the annex.

Action requested of the Sub-Committee

6 The Sub-Committee is invited to:

.1 consider the draft revised text of the Iridium SafetyCast service manual, as set out in the annex*, and forward it to MSC 104 for approval;

.2 noting that this is a new publication and to allow adequate time for circulation within the maritime community, recommend to the Maritime Safety Committee an implementation date of 1 January no less than 12 months after approval by the Committee; and

.3 agree that future editions of the Iridium SafetyCast service manual should follow the amendment procedure agreed by NCSR 4 for MSI related documentation (NCSR 4/29, paragraphs 11.8 and 11.9).

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* A version of this annex with track changes can be requested by sending an e-mail to NCSR@imo.org.

ANNEX[1]

PROPOSED AMENDMENTS TO THE INTERIM IRIDIUM SAFETYCAST SERVICE MANUAL

REVISED INTERIM IRIDIUM SAFETYCAST SERVICE MANUAL

1 The Maritime Safety Committee, at its 101st session (5 to 14 June 2019), approved the Interim Iridium SafetyCast service manual, as set out in the annex, which provides information on Iridium's enhanced group calling service, for circulation to Member States as advance information.

2 Member States were invited, pending completion of a final text by the Sub-Committee on Navigation, Communications and Search and Rescue, to take account of the information contained in the draft manual when conducting system trials and tests.

3 The Committee also established an IMO Enhanced Group Call Coordinating Panel for coordinating the development and use of the international satellite-based enhanced group calling service. The Panel's terms of reference and certification process are given in MSC.1/Circ.1635.

4 The Committee, at its [104th] session, approved the revised Interim Iridium SafetyCast service~~s~~ manual, as set out in the annex, which should become effective on [1 January 2023].

6 This circular replaces MSC.1/Circ.1613.

5 Member States intending to use the Iridium SafetyCast service are invited to take account of the Iridium SafetyCast service manual.

[1] A version of this annex with track changes can be requested by sending an email to NCSR@imo.org.

ANNEX

INTERIM IRIDIUM SAFETYCAST SERVICE MANUAL
~~FIRST~~ 2023 EDITION

Foreword

SOLAS regulation IV/12.2 states that "Every ship, while at sea, shall maintain a radio watch for broadcasts of maritime safety information on the appropriate frequency or frequencies on which such information is broadcast for the area in which the ship is navigating".

In 2013, a submission was made to the Maritime Safety Committee (MSC), at its ninety-second session, for evaluation of the Iridium mobile-satellite system against the criteria for provision of mobile satellite communication systems in the Global Maritime Distress and Safety System (GMDSS). In 2018, the MSC, at its ninety-ninth session, adopted resolution MSC.451(99) on *Statement of recognition of the maritime mobile satellite services provided by Iridium Satellite LLC*, including Iridium's enhanced group calling service. It was noted an operational manual, similar to the International SafetyNET Manual, was necessary. The Committee also acknowledged the role of the International SafetyNET Coordinating Panel that worked on behalf of the Committee with respect to the implementation of the provision of maritime safety information in accordance with the guidance material approved by the Committee. Since then, the Iridium enhanced group call service has been named "Iridium SafetyCast".

The Maritime Safety Committee, at its 101st session (5 to 14 June 2019) approved the Interim Iridium SafetyCast Manual, as set out in the annex to circular MSC.1/Circ.1613, which provided information on Iridium's Enhanced Group Call (EGC) service, for circulation to Member States as advance information. Member States were invited, pending completion of a final text by the Sub-Committee on Navigation, Communications and Search and Rescue (NCSR), to take account of the information in the draft manual when conducting system trials and tests.

~~The Sub-Committee on Navigation, Communications and Search and Rescue, at its [eighth] session, completed the final text of this first edition of the Iridium SafetyCast Service Manual.~~

This Manual has been produced to describe the Iridium system and its capability for promulgating maritime safety information (MSI) and search and rescue (SAR) related information. This Manual has been prepared with the cooperation of the IHO WWNWS Sub-Committee, the WMO WWMIWS Standing Sub-Committee and their respective Secretariats. This Manual should be read alongside the Joint IMO/WMO/IHO Manual on Maritime Safety Information.

1 General information

1.1 The Iridium SafetyCast service is a satellite-based service for the promulgation of MSI, navigational and meteorological warnings, meteorological forecasts, SAR related information and other urgent safety-related messages to ships.

1.2 The Iridium SafetyCast service fulfils an integral role in the GMDSS developed by the International Maritime Organization (IMO) and incorporated into the 1988 amendments to the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended, as a requirement for ships to which the Convention applies.

1.3 This Manual describes the structure and operation of the Iridium SafetyCast service. It is intended primarily for national Administrations and registered information providers, but may also be useful to the mariner who requires more operational information than is found in manufacturers' equipment manuals.

2 Iridium SafetyCast service

2.1 Introduction

2.1.1 The Iridium SafetyCast service provides shipping with navigational and meteorological warnings, meteorological forecasts, shore-to-ship distress alert relays, SAR related information and other urgent information in accordance with SOLAS requirements. It provides an automatic method of broadcasting messages to both fixed and variable geographical locations in all sea areas, including the means of disseminating MSI to coastal warning areas not covered by the International NAVTEX service. It is suitable for use in all sizes and types of ships. Figures 1 and 2 illustrate the way the service is structured.

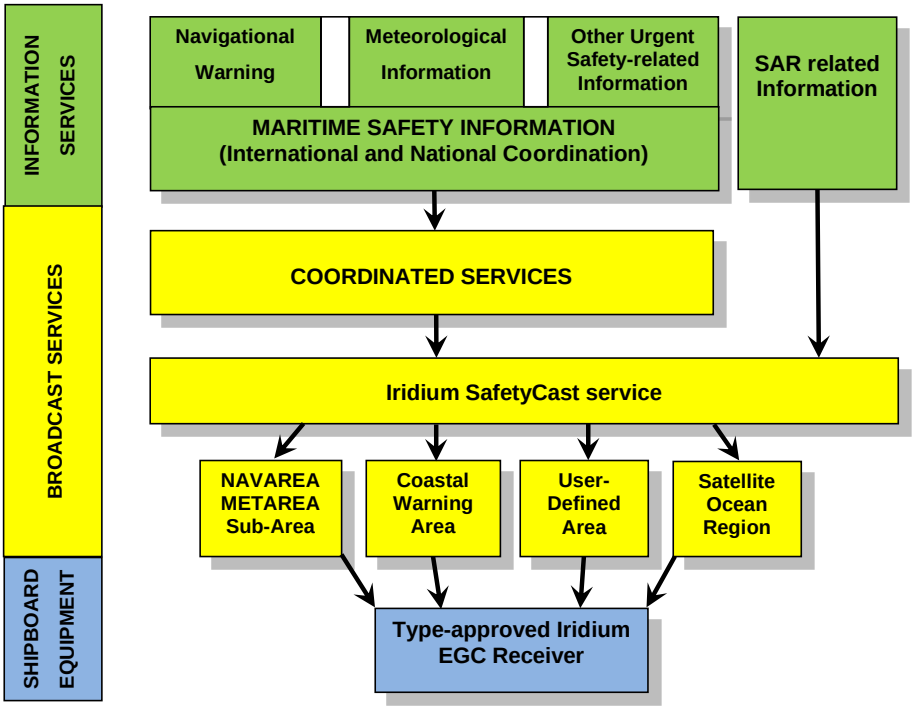

Figure 1 – Iridium SafetyCast service system

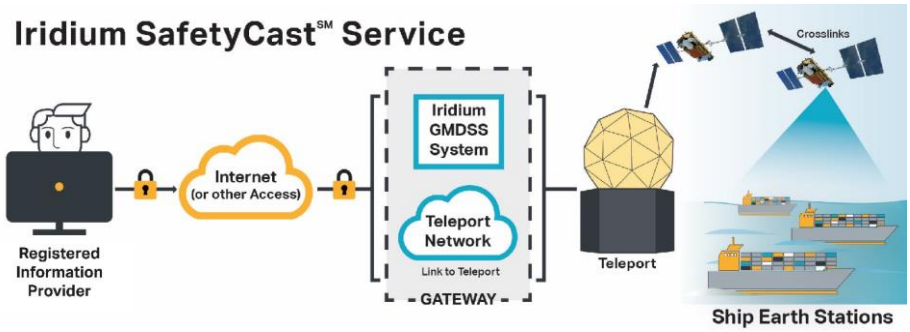

Figure 2 – Basic concept of the Iridium SafetyCast service

2.1.2 The Iridium SafetyCast service offers the ability to direct a message to a given geographical area. The area may be fixed, as in the case of a NAVAREA/METAREA or coastal warning area; or it may be a user-defined area (circular or rectangular). A user-defined area is used for messages, such as a local storm warning or a shore-to-ship distress alert relay, for which it is inappropriate to alert ships in an entire NAVAREA/METAREA. The basic concept of the service is shown in figure 2 above.

2.1.3 Messages are submitted by registered information providers via an Iridium gateway. Messages are broadcast according to their priority, i.e. distress, urgency or safety. Aboard ships, messages are received by type-approved Iridium Ship Earth Station (SES) EGC receivers.

2.2 Definitions

2.2.1 For the purposes of this manual, the following definitions apply:

.1 *Coastal warning* means a navigational warning or in-force bulletin promulgated as part of a numbered series by a National Coordinator. Broadcast should be made by the International NAVTEX service to defined NAVTEX service areas and/or by an International Enhanced Group Call service to the coastal warning area. In addition, Administrations may issue coastal warnings by other means.

.2 *Coastal warning area* means a unique and precisely defined sea area within a NAVAREA/METAREA or Sub-Area established by a coastal State for the purpose of coordinating the promulgation of coastal Maritime Safety Information through an International Enhanced Group Call service.

.3 *Coastal and offshore waters* apply to areas for which WMO Members issue weather and sea bulletins, governed by the procedures in the Manual on Marine Meteorological Services (WMO-No.558).

.4 *Enhanced Group Call (EGC)* means the international broadcast of coordinated Maritime Safety Information and Search and Rescue related information, to a defined geographical area using a recognized mobile satellite service.

.5 *Expiry* means the time and date, set by the information provider, where the system will stop the information being automatically transmitted to vessels. Expiry is a specific feature of the Iridium SafetyCast service and does not impact the information available on the Ship Earth Station as per the performance and test standards.

.~~6~~5 *Gateway* means a terrestrial part of a mobile satellite system that acts as an interface between the network and other communication networks.

.~~7~~6 *Global Maritime Distress and Safety System (GMDSS)* means a system that performs the functions set out in SOLAS regulation IV/4.

.~~8~~7 *In-force bulletin* means a list of serial numbers of those NAVAREA, Sub-Area or coastal warnings in force issued and promulgated by the NAVAREA Coordinator, Sub-Area Coordinator or National Coordinator.

.~~9~~8 *International Enhanced Group Call service* means the coordinated broadcast and automatic reception of Maritime Safety Information and Search and Rescue related information via Enhanced Group Call, using the English language.

.10~~9~~ *International Iridium SafetyCast service* means the coordinated broadcast and automatic reception of Maritime Safety Information and Search and Rescue related information via the Enhanced Group Call system, using the English language.

.11~~0~~ *International NAVTEX service* means the coordinated broadcast and automatic reception on 518 kHz of Maritime Safety Information by means of narrow-band direct-printing telegraphy using the English language.[2]

.12~~1~~ *Iridium Safety Gateway* means the central system responsible for managing GMDSS communications within the Iridium Network.

.13~~2~~ *Issuing Service* means a National Meteorological and Hydrological Service (NMHS) or National Authority which has accepted responsibility for ensuring that meteorological warnings and forecasts for shipping are disseminated through the International Enhanced Group Call service to the designated METAREA for which the NMHS or National Authority has accepted responsibility under the broadcast requirements of the Global Maritime Distress and Safety System.[3]

.14~~3~~ *Local warning* means a navigational warning which covers inshore waters, often within the limits of jurisdiction of a harbour or port authority.

.15~~4~~ *Maritime Safety Information (MSI)*[4] means navigational and meteorological warnings, meteorological forecasts and other urgent safety-related messages broadcast to ships.

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2 As set out in the IMO NAVTEX Manual.

3 As defined in WMO-No.558.

4 As defined in SOLAS regulation IV/2.

.1~~6~~5 *Maritime Safety Information service* means the internationally and nationally coordinated network of broadcasts containing information which is necessary for safe navigation.

.1~~7~~6 *METAREA* means a geographical sea area[5] established for the purpose of coordinating the broadcast of marine meteorological information. The term METAREA followed by a roman numeral may be used to identify a particular sea area. The delimitation of such areas is not related to and should not prejudice the delimitation of any boundaries between States (see figure 3).

.1~~8~~7 *METAREA Coordinator* means the individual with the authority to coordinate Marine Meteorological Information broadcasts by one or more National Meteorological and Hydrological Services acting as Preparation or Issuing Services within the METAREA.

.1~~9~~8 *Meteorological information* means the marine meteorological warnings and forecast information in accordance with the provisions of the International Convention for the Safety of Life at Sea, 1974, as amended.

.20~~19~~ *National Coordinator* means the national authority charged with collating and issuing coastal warnings within a national area of responsibility.

.2~~1~~0 *National Enhanced Group Call service* means the broadcast and automatic reception of Maritime Safety Information via the EGC system, using languages as decided by the Administration concerned.

.2~~2~~1 *NAVAREA* means a geographical sea area[6] established for the purpose of coordinating the broadcast of navigational warnings. The term NAVAREA followed by a roman numeral may be used to identify a particular sea area. The delimitation of such areas is not related to and should not prejudice the delimitation of any boundaries between States (see figure 4).

.2~~3~~2 *NAVAREA Coordinator* means the authority charged with coordinating, collating and issuing NAVAREA warnings for a designated NAVAREA.

.2~~4~~3 *NAVAREA warning* means a navigational warning or in-force bulletin promulgated as part of a numbered series by a NAVAREA Coordinator.

.2~~5~~4 *Navigational warning* means a message containing urgent information relevant to safe navigation broadcast to ships in accordance with the provisions of the International Convention for the Safety of Life at Sea, 1974, as amended.

.2~~6~~5 *Other urgent safety-related information* means Maritime Safety Information broadcast to ships that is not defined as a navigational warning or meteorological information. This may include, but is not limited to, significant malfunctions or changes to maritime communications systems, and new or amended mandatory ship reporting systems or maritime regulations affecting ships at sea.

.2~~7~~6 *Preparation Service* means a National Meteorological and Hydrological Service or National Authority which has accepted responsibility for the

[5] Which may include inland seas, lakes and waterways navigable by seagoing ships.

[6] Which may include inland seas, lakes and waterways navigable by seagoing ships.

preparation of warnings and forecasts, and warnings for parts of or an entire METAREA in the WMO system for the dissemination of meteorological forecasts to shipping under the GMDSS and for their transfer to the relevant Issuing Service for broadcast.

.2~~8~~7 *Recognized mobile satellite service* means any service which operates through a satellite system and is recognized by IMO for use in the GMDSS.

.2~~9~~8 *Registered information provider* means a Maritime Safety Information provider (MSI provider) or a Search and Rescue Information provider, authorized in accordance with annex 2 to the IMO Enhanced Group Call Coordinating Panel (MSC.1/Circ.1635).

.30~~29~~ *Rescue Coordination Centre (RCC)* means a unit responsible for promoting efficient organization of search and rescue services and for coordinating the conduct of search and rescue operations within a search and rescue region. Note: the term RCC will be used within this Manual to apply to either joint, aeronautical or maritime centres; JRCC, ARCC or MRCC will be used as the context warrants.

.3~~1~~0 *Search and Rescue (SAR) related information* means distress alert relays and other urgent search and rescue related information broadcast to ships.

.3~~2~~1 *Satellite Network Operations Center (SNOC)* means a terrestrial part of the Iridium mobile-satellite system which controls the Iridium satellites and manages the Iridium system overall.

.3~~3~~2 *Satellite Ocean Region*[7] means the area on the earth's surface within which a mobile or fixed antenna can obtain line-of-sight communications with one of the five primary Inmarsat geostationary satellites. This area may also be referred to as the "footprint":

- Atlantic Ocean Region – East (AOR-E)
- Atlantic Ocean Region – West (AOR-W)
- Indian Ocean Region (IOR)
- Pacific Ocean Region (POR)

.3~~4~~3 *Sea Area A1* means an area within the radiotelephone coverage of at least one VHF coast station in which continuous DSC[8] alerting is available, as may be defined by a Contracting Government.

.3~~5~~4 *Sea Area A2* means an area, excluding sea area A1, within the radiotelephone coverage of at least one MF coast station in which continuous DSC alerting is available, as may be defined by a Contracting Government.

.3~~6~~5 *Sea Area A3* means an area, excluding sea areas A1 and A2, within the coverage of a~~n~~ recognized mobile satellite service supported by the ship

[7] The Iridium system is not limited to specific Ocean Regions, therefore the Iridium SafetyCast equivalent for this would be a global transmission or sending to the Global Ocean Region. Other "Ocean Regions", such as an Arctic Ocean Region, could also be created as predefined areas in the Iridium SafetyCast system.

[8] Digital selective calling (DSC) means a technique using digital codes, conforming to the technical structure and content set forth in the most recent version of Recommendations ITU R M.493 and ITU R M.541, which enables a radio station to establish contact with and transfer information to another station or group of stations.

earth station carried on board ~~Inmarsat geostationary satellite~~ in which continuous alerting is available.

.3~~7~~6 *Sea Area A4* means an area outside sea areas A1, A2 and A3.

.3~~8~~7 *Ship Earth Station (SES)* means a mobile earth station in the recognized maritime mobile satellite service located on board a ship. This may also be referred to as Mobile Earth Station (MES) or a maritime mobile terminal.[9]

.3~~9~~8 *Sub-Area* means a subdivision of a NAVAREA/METAREA in which a number of countries have established a coordinated system for the promulgation of Maritime Safety Information. The delimitation of such areas is not related to and should not prejudice the delimitation of any boundaries between States.

.40~~39~~ *Sub-Area Coordinator* means the authority charged with coordinating, collating and issuing Sub-Area warnings for a designated Sub-Area.

.4~~10~~ *Sub-Area warning* means a navigational warning or in-force bulletin promulgated as part of a numbered series by a Sub-Area Coordinator. Broadcast should be made by the International NAVTEX service to defined NAVTEX service areas or by an International Enhanced Group Call service (through the appropriate NAVAREA Coordinator).

.4~~21~~ *Teleport* means a terrestrial part of the Iridium mobile-satellite system which communicates between the Iridium satellites and the gateway and Satellite Network Operations Center terrestrial parts.

.4~~32~~ *User-defined area* means a temporary geographic area, either circular or rectangular, to which Maritime Safety Information or Search and Rescue related information is addressed.

.4~~43~~ *UTC* means Coordinated Universal Time which is equivalent to GMT (or ZULU) as the international time standard.

.4~~54~~ *Worldwide Met-Ocean Information and Warning Service (WWMIWS)*[10] means the internationally coordinated service for the promulgation of meteorological warnings and forecasts.

.4~~65~~ *World-Wide Navigational Warning Service (WWNWS)*[11] means the internationally and nationally coordinated service for the promulgation of navigational warnings.

.4~~76~~ In the operating procedures *coordination* means that the allocation of the time for data broadcast is centralized, the format and criteria of data transmissions are compliant as described in the *Joint IMO/IHO/WMO Manual on Maritime Safety Information* and that all services are managed as set out in resolutions A.705(17), as amended, A.706(17), as amended, and A.1051(27), as amended.

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9 SES within this document refers to a type approved EGC capable ship earth station.

10 As set out in resolution A.1051(27), as amended.

11 As set out in resolution A.706(17), as amended.

2.2.2 METAREA Limits:

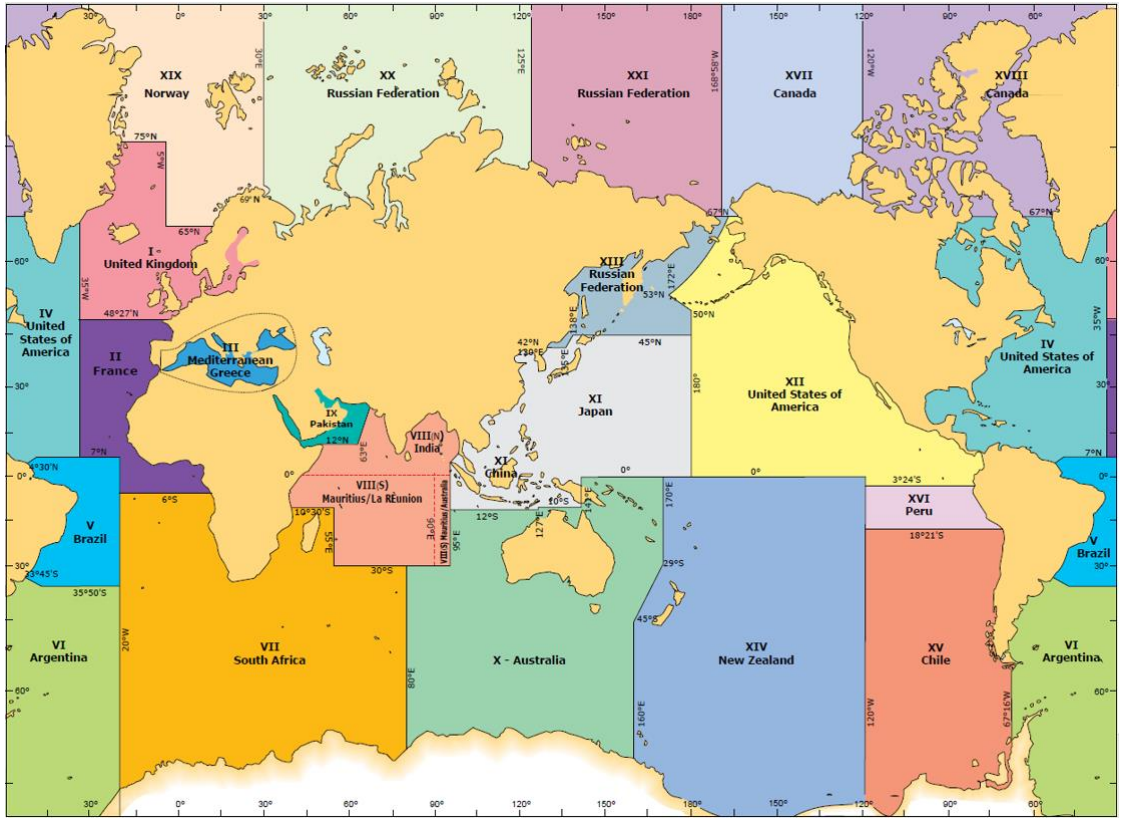

Figure 3 – Geographical areas for coordinating and promulgating METAREA warnings and forecasts.

The delimitation of these METAREAs is not related to and should not prejudice the delimitations of any boundaries between States.

2.2.3 NAVAREA Limits:

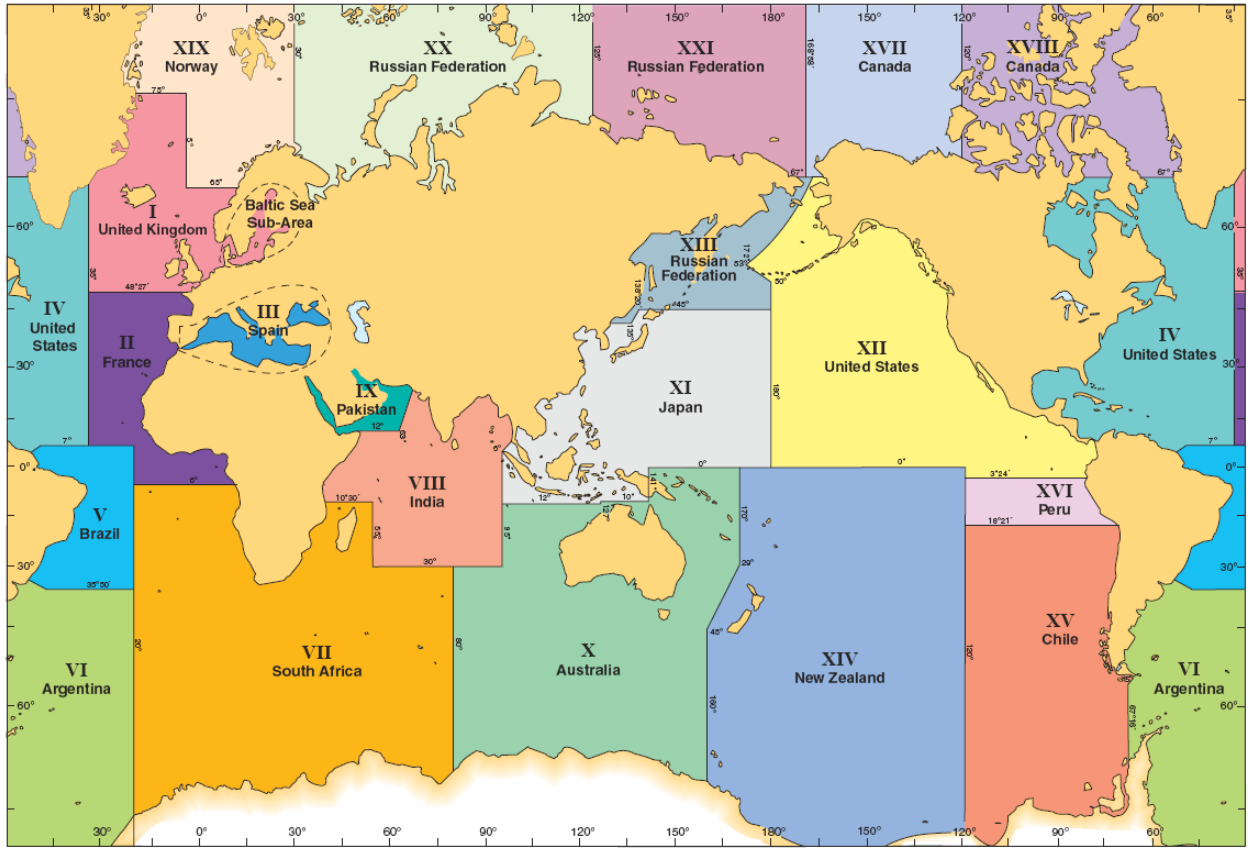

Figure 4 – Geographical areas for coordinating and promulgating NAVAREA warnings.
The delimitation of these NAVAREAs is not related to and should not prejudice the delimitations of any boundaries between States.

3 General features of the Iridium SafetyCast service

3.1 All navigable waters of the world are covered by satellites in the Iridium global satellite system. Reception of Iridium SafetyCast messages is normally not affected by the position of the ship, atmospheric conditions or time of day.

3.2 Area calls can be addressed to a fixed geographical area (NAVAREA/METAREA or coastal warning area) or to a user-defined area (circular or rectangular) selected by an information provider. Area calls or coastal warnings will be received automatically by any Iridium SafetyCast receiver within that area. Iridium SafetyCast receivers can be set up to receive additional fixed geographical areas.

3.3 The Iridium network enables the promulgation of MSI, SAR related information and other urgent safety related messages to ships. Messages are initiated via a secure, web-based portal that Iridium will make available to registered information providers, or by such other means of access as may be agreed to. Using the portal, registered information providers will input the text of the message and specify the delivery characteristics for each message. The delivery characteristics that the registered information providers specify include message priority, geographical area, scheduling and cancellation of the broadcast, as applicable.

3.4 Each message is queued at a server in the Iridium Safety Gateway and scheduled for broadcast. When queued for broadcast, the message is routed to the appropriate teleport(s) for delivery to the satellite(s). The message is then routed from the teleport to one, or more, satellite(s) depending on the geographical area for broadcast. The satellite then utilizes an L-band channel to transmit the message to Iridium SESs. A flow diagram for shore-to-ship promulgation of Iridium SafetyCast messages is provided in figures 1 and 2 above.

3.5 Specific geographical sea areas are defined for each NAVAREA/METAREA (see figures 3 and 4), and for Coastal areas. These are defined by a set of coordinates which provides the boundary of the delivery area.

3.6 The revised Joint IMO/IHO/WMO Manual on Maritime Safety Information (MSI) provides that a NAVAREA Coordinator should have access to broadcast systems for transmission to the navigable waters of the NAVAREA and that reception should normally be possible at least 300 nautical miles beyond the limit of the NAVAREA (see also resolution MSC.469(101), "Amendments to resolution A.706(17), World-Wide Navigational Warning Service" and resolution MSC.470(101), "Amendments to resolution A.1051(27), World-Wide Met-Ocean Information and Warning Service").

3.7 The IMO performance standards for SESs for use in the GMDSS require that facilities should be provided for the SESs to receive MSI for the NAVAREA/METAREA and the coastal warning areas and different classes of messages where the ship is sailing and 300 nautical miles beyond the limits of the NAVAREA/METAREA. Therefore, the delivery area for each NAVAREA/METAREA extends from the boundary of each of the areas to 300 nautical miles beyond the line of demarcation with an adjacent NAVAREA/METAREA. This permits an SES outside of a NAVAREA/METAREA to receive a message in that adjacent NAVAREA/METAREA if the SES is within 300 nautical miles of that NAVAREA/METAREA boundary.

3.8 Aboard the ship, the Iridium SES should be interconnected to a message display and alarm panel that will perform the proper filtering, recording, alerting and display of messages. Additionally, an SES may have a keyboard and printer. The SES will receive the message and then transfer the message content, along with the message priority, to the other components of the GMDSS system on board the ship. The SES shall be designed according to IMO performance standards for such equipment.

3.9 The IMO performance standards for SESs for use in the GMDSS require that if a dedicated display device or a connection to a navigation system is used, it should meet the general requirements of the Organization for such devices and the capability of showing at least 16 lines by 40 characters, with a non-volatile memory of at least 255 messages of 1,023 characters.

4 Planning of new Iridium SafetyCast service

4.1 Authorities wishing to become officially registered information providers of MSI and SAR related information to ships at sea via the Iridium SafetyCast service should contact IMO via the IMO EGC Coordinating Panel at an early stage for advice. The plans of any prospective registered information providers should be coordinated with the IMO, IHO and WMO and with other national authorities, before authorization to broadcast via Iridium SafetyCast service may be granted by the IMO, in accordance with the procedures of the IMO EGC Coordinating Panel.

4.2 Once authorized and registered, information providers should contact Iridium in order to determine specific details for addressing messages, accessing the Iridium SafetyCast service, charges and payment for services and any other matters with respect to providing MSI and SAR related information to mariners.

4.3 The IMO EGC Coordinating Panel, in cooperation with IHO and WMO, undertakes the coordination of times for scheduled transmissions.

4.4 Mariners should be informed of the establishment of an Iridium SafetyCast service by the registered information provider through the inclusion of full details in Notices to Mariners and other nautical publications, and the IMO Master Plan of Shore-Based Facilities for the GMDSS, as maintained in the Global Integrated Shipping Information System (GISIS). In addition, full details of the service should be sent to the IMO EGC Coordinating Panel.

4.5 Questions concerning promulgation of MSI and SAR related information through the Iridium SafetyCast service can be addressed to the IMO EGC Coordinating Panel.

4.6 Questions concerning the operation of the Iridium SafetyCast service should be addressed to:

Maritime Safety Services
Iridium Satellite LLC
1750 Tysons Boulevard, Suite 1400
McLean, VA
22102 USA

Email address: maritime.safety@iridium.com

5 Changes to existing Iridium SafetyCast service

5.1 Registered information providers wishing to change their existing service should follow the same coordination procedures as for a new service, in accordance with the procedures of the IMO EGC Coordinating Panel.

5.2 Mariners should be informed of the changes to an existing service by the information provider through the inclusion of full details in Notices to Mariners and other nautical publications and the IMO Master Plan of shore-based facilities for the GMDSS. In addition, full details of the service should be sent to the IMO EGC Coordinating Panel.

6 Operation of the Iridium SafetyCast service

6.1 To be more geographically relevant, some form of selectivity in receiving and printing the various messages is required. All ships within the geographically defined area of the broadcast will receive area calls; however, they will only be displayed and printed by those receivers that recognize both:

.1 the fixed geographical area (NAVAREA/METAREA), user-defined area as appropriate; and

.2 for coastal warnings, the coastal warning area and the subject indicator for the message.

6.2 The message includes a preamble which enables the SES to display and print only those messages which relate to its present position, to the intended route, or to the aforementioned areas as programmed by the operator.

6.3 For messages for coastal warning areas, the registered information provider must ensure the preamble includes the identifier allocated for the particular area, along with the appropriate subject indicator (see section 11.3). The SES can be set to reject messages concerning certain optional subjects which may not be required by the ship. The SES also uses the subject indicator to identify coastal warnings which, because of their importance, may NOT be rejected.

6.4 Reception of certain types of messages, such as shore-to-ship distress alert relays, SAR related information, meteorological warnings and forecasts and navigational warnings, addressed to a geographical area within which the SES is located, is mandatory and cannot be suppressed by ships in the affected area.

6.5 When a message has been received error-free, a record is made of the message identification (the unique sequence number, the unique identifier and the service code) associated with that message. The unique sequence number is used to suppress the display and printing of repeated transmissions of the same message.

6.6 The Iridium SafetyCast service allows several input parameters to support MSI and SAR related information transmissions:

.1 fixed geographical area (NAVAREA/METAREA) or user defined area/areas;

.2 message priority (Distress, Urgency, Safety and Routine);

.3 delivery method (immediate or scheduled); and

.4 repeat (number of instances).

6.7 Messages can be addressed to user-defined areas, which may be circular or rectangular in shape (see figure 5a). A circular area is described by latitude and longitude of the centre in degrees and radius of the circle in nautical miles. A rectangular area is described by latitude and longitude of the south-west corner in degrees and extension in degrees to the north and east of the rectangle. Messages may also be addressed to a coastal warning area. Each satellite has a footprint of approximately 4,500 km (approximately 2,500 nautical miles) diameter and comprises 48 spot beams of approximately 400 km (approximately 220 nautical miles) diameter (see figure 5b). Each beam within a footprint overlaps, as do the beams from adjacent satellites. The Iridium system dynamically uses the most appropriate combination of beams and satellites for the delivery area required.

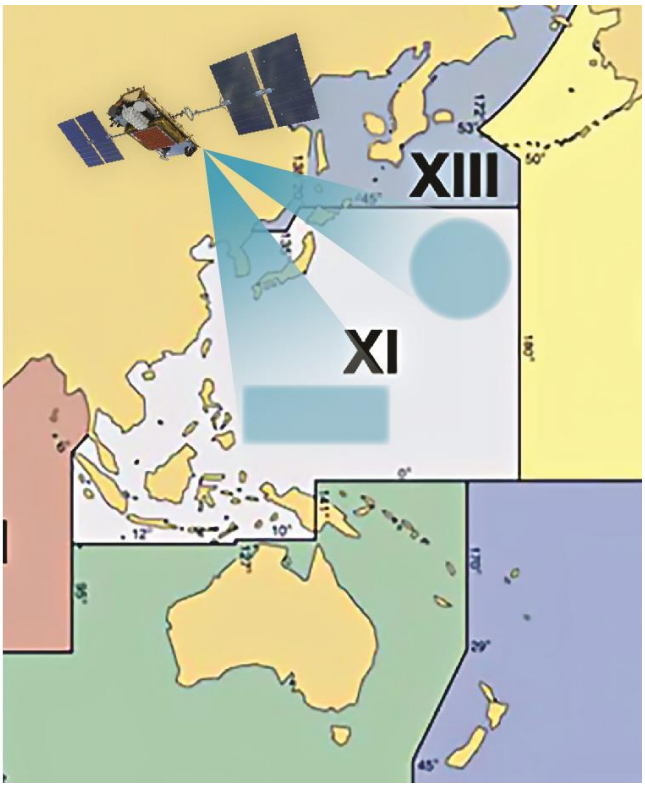

Figure 5a – Examples of message addressing to circular and rectangular areas

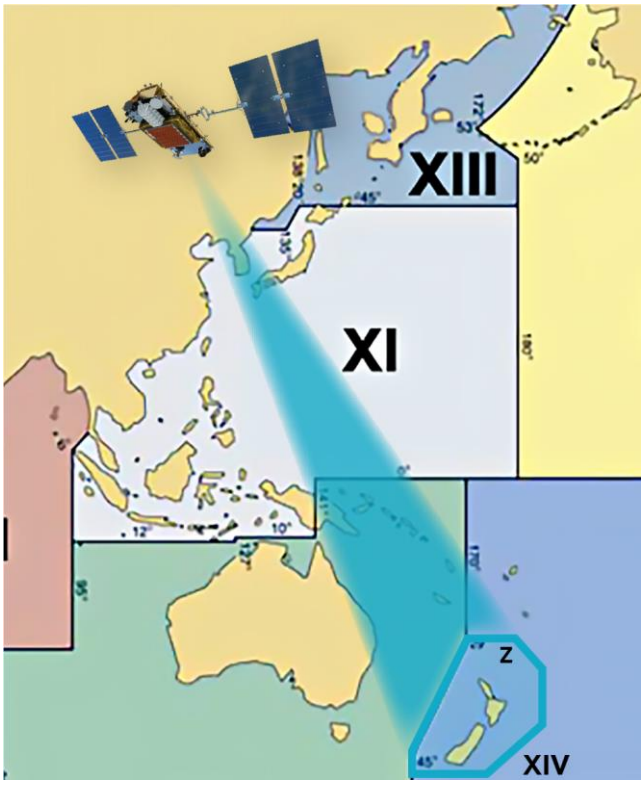

Figure 5b – Example of message addressing to a coastal area

6.8 In the case of a ship in distress, it is often appropriate to create a circular user-defined area, defined by the position of the casualty and a radius around the casualty to alert ships that may be able to render assistance. If no response is received from any ship at the first call, the area can be expanded in steps until an acknowledgement by one or more ships is received. In cases where the position of the distress is unknown, broadcasts to a rectangular area may be more appropriate (as paragraph 6.7 above), or a shore-to-ship distress alert relay can be transmitted to all ships, in a user-defined sea area. SAR related information should only be addressed to circular or to rectangular user-defined areas.

7 Promulgation of MSI or SAR related Information

7.1 MSI or SAR related information is promulgated by registered information providers whose Certificates of Authorization to promulgate via Iridium are issued by IMO in accordance with the procedures of the IMO Enhanced Group Call Coordinating Panel. Registered information providers include, for example:

.1 NAVAREA Coordinators: for navigational warnings and other urgent safety-related information;

.2 National Coordinators: for coastal warnings and other urgent safety-related information;

.3 METAREA Coordinators: for meteorological warnings and forecasts; and

.4 Rescue Coordination Centres: for shore-to-ship distress alert relays, SAR related information and other urgent safety-related information.

7.2 All NAVAREA, Sub-Area and coastal warnings and METAREA warnings and forecasts should be promulgated only in English in the Iridium SafetyCast service in accordance with resolutions A.706(17), as amended, and A.1051(27), as amended. In addition to the required broadcasts in English, NAVAREA/METAREA, Sub-Area and coastal warnings may be broadcast in a national language using a national Iridium SafetyCast service.

7.3 Registered information providers should take into account the need for contingency planning.

7.4 Scheduled transmissions are made at specified times, as allocated by the IMO EGC Coordinating Panel. These schedules are published in nautical publications and the IMO Master Plan of Shore-Based facilities for the GMDSS, as amended.

7.5 MSI providers should adhere to their published scheduled broadcast times to facilitate reception of messages.

8 Message formatting and C codes

8.1 The Iridium SafetyCast service does not require registered information providers to manually enter transmission instructions using C codes, although some registered information providers may have an operational requirement to use these. For those users who have a continuing operational requirement to use C codes, appendix 2, part 2 of this manual is provided.

8.2 There are several methods for registered information providers to gain access to the Iridium SafetyCast service, and these are described in section 10 and appendix 2.

9 Monitoring of MSI and SAR related broadcasts[12]

9.1 In order to ensure the integrity of the MSI and SAR related messages being broadcast, registered information providers ~~must~~ should monitor the broadcasts which they originate in accordance with resolutions A.706(17) and A.1051(27), as amended, and COMSAR/Circ.37, as amended. Monitoring is especially important in a highly automated service, which is dependent on careful adherence to procedure and format. This should be accomplished by a ~~service~~ type approved Iridium EGC receiver or by other appropriate ~~that should provide the~~ means to enable each registered information provider to:

.1 confirm that the message is transmitted and received correctly;

.2 ensure that cancellation messages are properly executed; and

.3 observe any unexplained delay in the message being broadcast.

[12] Monitoring of MSI and SAR related broadcast in a multi provider environment is currently under discussion within the relevant IMO, IHO, WMO MSI and SAR bodies.

9.2 The SES maintains a Log, which contains information on all messages received by the terminal. See figure 6.

This information within the Log includes:

Message number	Generated by the terminal
Originator	ID of the registered information provider which transmits the message.
Service	The SES displays a short title for the particular type message service.
Priority	The SES displays the appropriate Priority. This could be: Distress, Urgency, Safety or Routine.
Received date and time	The date time group YY-MM-DD HH:mm of when the message was received. A format of the date is configurable by the SES operator.
Size	Usually in number of bytes or characters.
Sequence number	The unique message sequence or reference number allocated to the message by the Iridium Safety Gateway.
Routeing	Message routeing (memory or memory and printer) – set up by the SES operator or a mandatory routeing for Urgency and Distress priority messages.

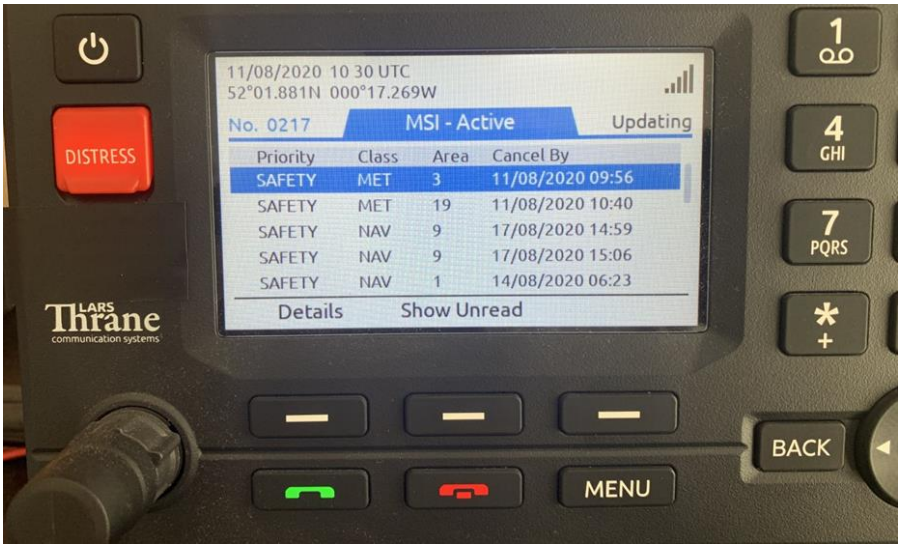

Figure 6 – Example of an Iridium SES Log Display

10 Accessing the Iridium SafetyCast service

10.1 MSI or SAR related information is promulgated by registered information providers whose Certificates of Authorization to promulgate via Iridium SafetyCast are issued by IMO in accordance with the procedures of the IMO EGC Coordinating Panel.

10.2 Messages may be initiated via a secure, web-based portal that Iridium will make available to registered information providers. Using the portal, registered information providers will input the text of the message and specify the delivery characteristics for each message. The delivery characteristics that the registered information providers specify include message priority, geographic region for broadcast, frequency of broadcast and cancellation of broadcast. Messages can also be manually cancelled.

10.3 Registered information providers may also elect to have a direct connection to the Iridium gateway using alternative means. Utilizing this interface, the message priority, delivery area, frequency of broadcast and cancellation of broadcast are specified by the message originator when the message is sent to the Iridium Safety Gateway for delivery.

11 Receiving transmission

11.1 When a message has been received, a record is made of the message identification associated with that message. The unique sequence number is used to suppress the display and printing of repeated transmissions of the same message. The Iridium SafetyCast system tracks the transmission and receipt of MSI broadcasts for each ship in the targeted area. The Iridium SafetyCast system filters messages that have already been received by the Iridium SESs in the area targeted by the registered information provider.

11.2 It is not possible to reject mandatory "all ship" messages such as shore-to-ship distress alert relays for the area within which the ship is located. When a distress or urgency message is received, an audio and visual alarm will be given.

11.3 The following subject indicators for coastal warnings are in use:[13]

A = Navigational warnings
B = Meteorological warnings
C = Ice reports
D = Search and rescue related information and acts of piracy warnings
E = Meteorological forecasts
F = Pilot service messages
G = AIS
H = Not used
I = Not used
J = SATNAV messages
K = Other navaid messages
L = Other navigational warnings – additional to subject code A
V = Special services allocation by the IMO EGC Coordinating Panel
W = Special services allocation by the IMO EGC Coordinating Panel
X = Special services allocation by the IMO EGC Coordinating Panel
Y = Special services allocation by the IMO EGC Coordinating Panel
Z = No messages on hand

[13] Subject indicators A, B and D cannot be rejected by the receiver.

11.4 It is recommended that, in order to ensure that all necessary MSI is available before sailing, the SES should remain in operation while the ship is in port. When the SES is switched on and logged onto the Iridium SafetyCast system it will automatically receive in-force messages.

11.5 Although reception of MSI and SAR related information is automatic, the shipboard operator must set up the SES properly before the start of the voyage, in accordance with the manufacturer's instructions.

11.6 The position information in an SES is updated automatically from integrated navigational receivers and these are fitted on all SESs, or may be updated from a separate electronic position-fixing system.

12 Charges for MSI services

12.1 Resolution A.707(17) on *Charges for distress, urgency and safety messages through the Inmarsat system* establishes the arrangements in place for the treatment of charges. Resolution A.1001(25) on *Criteria for the provision of mobile satellite communication systems in the Global Maritime Distress and Safety System (GMDSS)* requires that prospective satellite systems operating in the GMDSS undertake to apply the principles of resolution A.707(17), and Iridium has given such an undertaking.

12.2 There are no charges to the mariner for reception of these messages.

12.3 Message transmission charges apply to MSI providers and are set at a special tariff.

APPENDIX 1

The Iridium Global Mobile-Satellite System

1 Introduction

1.1 Iridium Satellite LLC owns and operates a Global Mobile Personal Communications by Satellite (GMPCS) system providing fully global digital communications. The major components of the Iridium mobile-satellite system are:

.1 the space segment, consisting of 66 operational satellites and additional in-orbit spare satellites;

.2 the ground segment, consisting of satellite teleports ("teleports") for the transfer of voice and data communications between the gateways and the satellite constellation, and gateways which provide connection to terrestrial voice and data networks; and

.3 mobile earth stations (MES), which consist of a satellite modem, which is incorporated into a commercial product, and an externally installed antenna. This may also be referred to as a Ship Earth Station (SES).

1.2 The satellite constellation provides the communication links between the MES and the teleport(s), which are interconnected to the gateways. The gateways serve as the switching centre, routing all communications into and from terrestrial networks, such as the Public Switched Telephone Network (PSTN). The gateway also locates, identifies and tracks subscribers for mobility management, and records user activity for billing purposes.

1.3 These components are illustrated in figure 7 below.

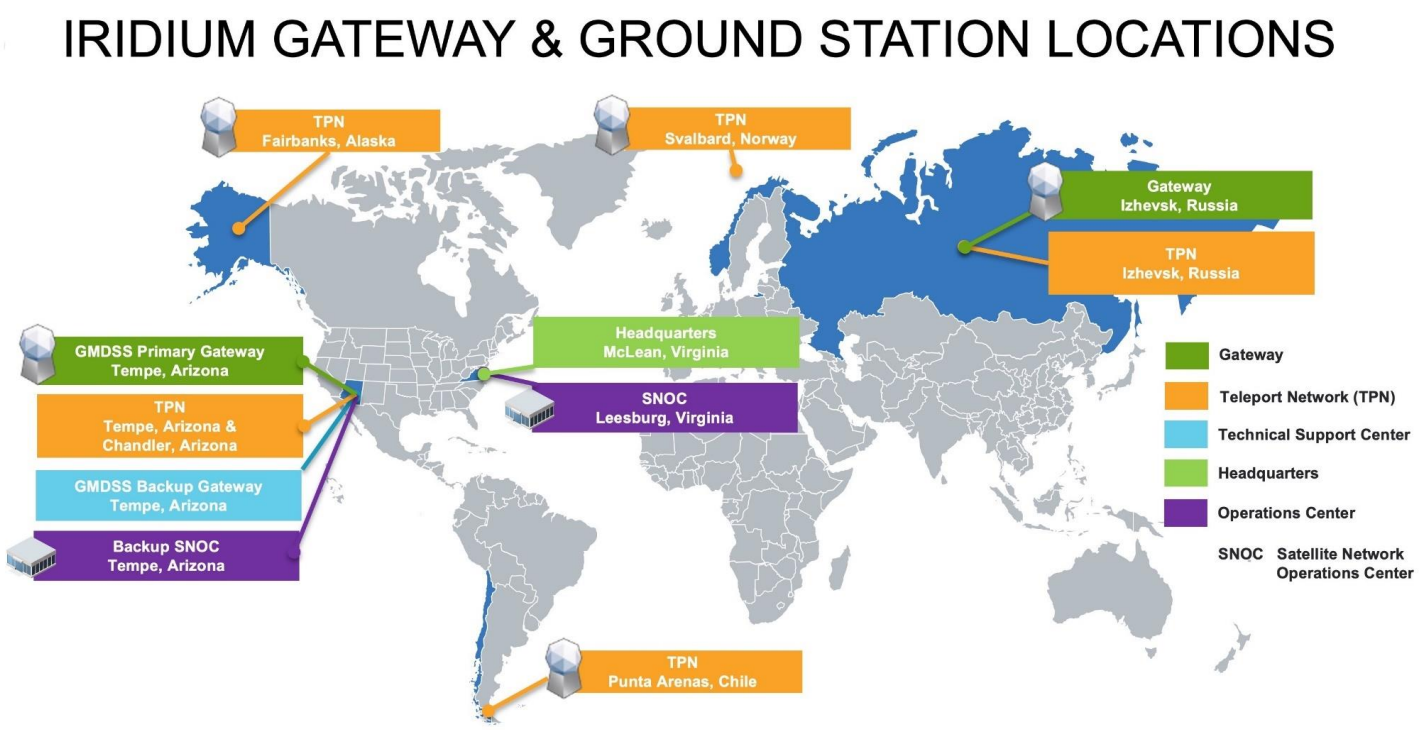

Figure 7 – The Iridium global satellite system, network overview

2 The space segment

2.1 The constellation of 66 operational Low Earth Orbit (LEO) satellites enables MES-to-MES, MES-to-gateway and gateway-to-MES communications. The 66 satellites are evenly distributed in six orbital planes with a polar (86.4 degree) inclination, with on-orbit spare satellites. The satellites orbit the Earth at an altitude of 780 km and take approximately 100 minutes to complete one orbit.

Figure 8 – Iridium constellation

2.2 The satellites support three types of communication links – satellite-to-satellite, satellite-to-teleport and satellite-to-MES. Each satellite communicates with the satellite immediately ahead and behind in its orbital plane (north/south) and to the nearest satellite in each of the two adjacent orbital planes (east/west) using a K-band link. The Iridium system is the first mobile-satellite system employing this cross-linked satellite architecture. As a result, an MES is not required to be within the same satellite footprint as a gateway in order to gain access to the network.

2.3 The satellite-to-MES link uses an L-band antenna system. This projects 48 spot beams, or cells, on the Earth, with each beam being approximately 400 km (approximately 250 miles, or 220 nautical miles) in diameter. Each satellite antenna has a "footprint" with a diameter of approximately 4,500 km (approximately 2,800 miles or 2,500 nautical miles). Adjacent satellite footprints overlap on the Earth's surface, enabling seamless global coverage from pole to pole. The overlapping coverage provided by the cross-linked satellites operates as a fully meshed network.

2.4 About once every minute, the coverage for a MES is provided by a different beam on the same satellite. About once every 6 minutes, the coverage transitions to a beam on an adjacent satellite. Special processing called a "handoff" ensures that communication sessions are maintained.

3 The ground segment

3.1 The Satellite Network Operations Center (SNOC) manages the satellite constellation and provides network management over the entire Iridium system. The SNOC communicates with the satellites through Telemetry, Tracking and Control (TTAC) facilities. In addition to controlling communications between the SNOC and the satellites, the TTAC sites track the Iridium satellites and receive telemetry data from them.

3.2 Iridium currently operates teleports at geographically diverse locations around the globe, as part of the commercial network (refer to figure 7). The teleports use a Ka-band link to interconnect the satellite constellation with the Iridium gateways for the transfer of communications to and from Iridium user terminals.

3.3 Operating as a switching centre, the primary gateway provides the connection between the Iridium network and terrestrial-based networks. Additional gateways may be added where appropriate, to enhance overall system reliability and capacity. Each gateway controls system access, call set-up, mobility management, billing, tracking and maintaining all information pertaining to MESs, such as user identity and geo-location.

3.4 Each message is queued at a server in the Iridium Safety Gateway and scheduled for broadcast. When queued for broadcast, the message is routed to the appropriate teleport(s) for broadcast to the satellite(s). The message is then routed from the teleport to one or more satellite(s) depending on the geographic region for broadcast.

4 Coverage area

4.1 The Iridium network provides fully global service coverage. All communication services are provided for MESs independent of geographic location. Communications are provided by a constellation of LEO satellites with overlapping coverage areas, providing global coverage.

5 Iridium network functional capabilities

5.1 The Iridium network permits ship-to-shore, shore-to-ship and ship-to-ship communications. It provides four levels of prioritization for all communications and performs pre-emption of lower priority communications, if necessary.

5.2 Only registered information providers will be allowed to input messages for broadcast. Approval and registration of these entities is performed by the IMO EGC Coordinating Panel by the procedure described in MSC.1/Circ.1635. During the approval and registration process, the means of access and the credentials needed by the authorized entity will be provided by the IMO EGC Coordinating Panel and Iridium. It is necessary to ensure that the prioritization of traffic is protected against inadvertent or malicious misuse. For example, access can be protected by requiring a two-stage access procedure using a password and PIN, and these could be combined into other functions where a registered information provider had existing alternative operational security measures in place. Registered information providers can input messages using email, a web interface or other means of transmitting data over the Internet, a leased line or VPN, according to their operational requirements. One such method is a secure portal provided by Iridium, a development version of which has been made available for testing and is subject to further refinement. Operational guidance for the use of the portal is given in appendix 2 part 1 of this manual.

5.3 Transmission of safety-related information by ships to shore authorities is accomplished using the communication capabilities of the Iridium system. Calls may be initiated to relevant shore authorities (hydrographic offices, meteorological offices or other shore authorities) using the contact details available in national lists of radio signals publications and elsewhere.

6 Network availability and service restoration

6.1 The Iridium network provides all services globally and is in continuous operation. System performance for each of the services is continuously monitored worldwide through numerous mechanisms. If there is a service impairment, Iridium will issue an advisory notice to registered information providers within 10 minutes of the impairment being identified by operations staff, and provide regular updates until the impairment is corrected. The constellation architecture and operation does not permit a single satellite to cause an extended service interruption from the user's perspective. The nature of the satellite footprints as they orbit ensures that ships will still be able to transmit distress alerts and to receive MSI or SAR related information even in the event of a satellite failure.

6.2 The International Mobile Satellite Organization (IMSO) will provide annual reports to IMO on Iridium's performance of its GMDSS functions, including availability during the reporting period.

APPENDIX 2

OPERATIONAL GUIDANCE

Part 1 of this appendix contains operational guidance for the benefit of registered information providers who are responsible for preparing messages for broadcast using a secure online portal (with graphical user interface or GUI) for accessing the Iridium SafetyCast service.

Part 2 of this appendix contains operational guidance for the benefit of registered information providers who are responsible for preparing messages for broadcast using a direct connection method (SFTP or email) for accessing the Iridium SafetyCast service (see paragraph 8 onwards).

Operational guidance – Part 1

For those registered information providers who require it, Iridium provides a secure online portal (with graphical user interface or GUI) for accessing the Iridium SafetyCast service.

For those registered information providers who require it, for example those who use tailor-made operational management systems, or whose messages are generated by highly automated (machine-to-machine) processes, Iridium will also make available an application programming interface (API) to enable access to the Iridium SafetyCast service.

Credentials

1 Only registered information providers will have access to the Iridium SafetyCast service. Authorization and certification of registered information providers follow the procedures of the IMO EGC Coordinating Panel. These registered information providers will be provided with credentials for access to the Iridium SafetyCast service. These credentials will identify the registered information provider to the service and will also determine which types of messages the registered information provider can send.

Message type

2.1 METAREA Coordinators can generally only select meteorological message types.

2.2 NAVAREA Coordinators can generally only select navigational message types.

2.3 SAR authorities can generally only select SAR coordination traffic or urgency and safety traffic message types.

Message priority

3.1 METAREA and NAVAREA Coordinators can select either "Safety" or "Urgency". SAR authorities can select either "Safety", "Urgency" or "Distress", whichever is appropriate to the emergency phase of the situation. A distress alert relay will be "Distress".

3.2 Although the service permits "Routine" priority, this is unlikely to be an appropriate priority for use by registered information providers.

Message delivery address

4.1 Delivery addresses can be a predefined or a user-defined area.

.1 Predefined addresses can include METAREA, NAVAREA, coastal warning area or another predefined area if required. These areas are created during the integration of the registered information provider with the Iridium SafetyCast service.

.2 User-defined areas are either circular or rectangular. These can be determined by the authority for a particular message.

4.2 When the message type is for delivery to a METAREA or NAVAREA, this will default to the area of the authority.

4.3 When the message type is for a coastal warning area or another predefined area, the authority selects that area from their particular list of predefined areas. The authority also selects the message subject.

4.4 When the message type is for delivery to a circular area, the authority defines that area with the latitude and longitude of its centre, and its radius in nautical miles.

4.5 When the message type is for delivery to a rectangular area, the authority defines that area with the latitude and longitude of its southwestern corner, and its extent north and east from that point, in degrees.

Scheduling, ~~repetition~~ expiry and cancellation

5.1 The option "Immediate" should be selected for immediate transmissions.

5.2 The option "Scheduled" should be selected for transmissions in accordance with the broadcast schedule determined by the IMO EGC Coordinating Panel.

5.3 It is a feature of the Iridium SafetyCast service that it will continue to monitor and transmit messages to receiving terminals, ensuring all those terminals which should receive a message, indicate by reply that they have received it. This will continue until the message "expires" according to the expiry time and date set by the registered information provider, or until the registered information provider sends a message to cancel that previous message.

5.4 The relationship between the repetition code and expiry for messages in the SafetyCast system is described in the tables at the end of part 2 of appendix 2.

5.5 At the end of the expiry period, the system will stop automatically broadcasting a message to ships entering the area or activating their terminals within the area. It is also possible for a registered information provider to cancel the automatic broadcast of their messages before the end of the expiry period.

5.6 These procedures are shown in the illustrations of the Iridium SafetyCast graphical user interface shown below.

Iridium SafetyCast Services Message Entry Graphical User Interface

6.1 Registered information providers and other users of the Iridium SafetyCast Services web interface will navigate to the launch page via "gmdss.iridium.com", shown in figure 9a below. Users will select the "Log In" button in the upper right corner and will be asked to enter their User ID and Password.

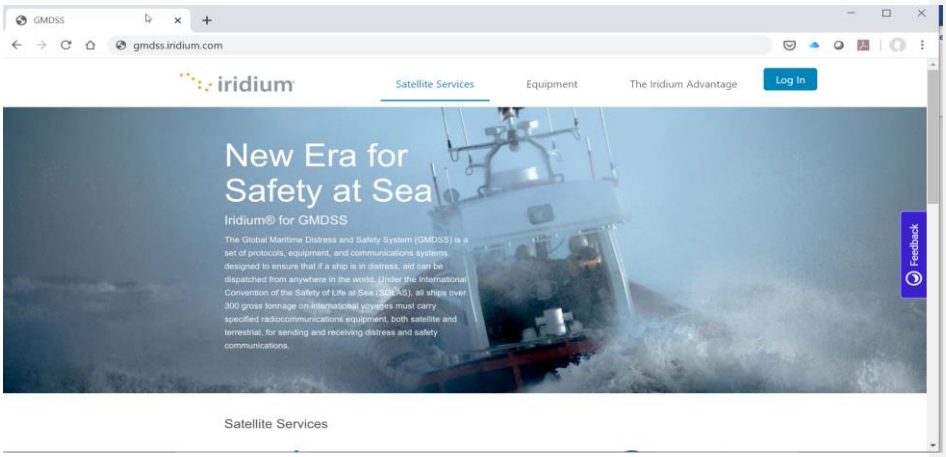

Figure 9a – Iridium GMDSS homepage

6.2 Users will select the "Log In" button in the upper right corner and will be asked to enter their User ID and Password in a new pop-up window, as shown in figure 9b below.

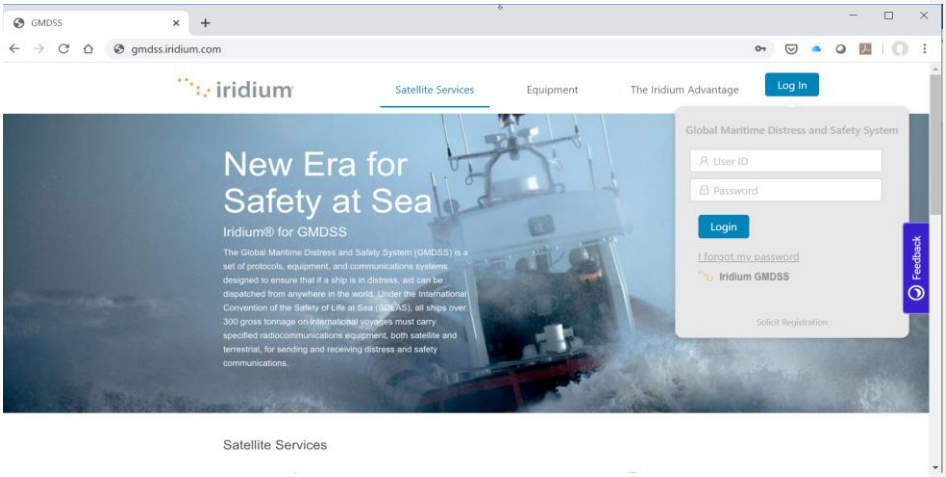

Figure 9b – Log In window

6.3 After authentication, the registered information provider will be brought to the "SafetyCast Messages" tab, shown in figure 9c below. This tab displays messages that have been sent, are scheduled to be sent in the future or have been cancelled.

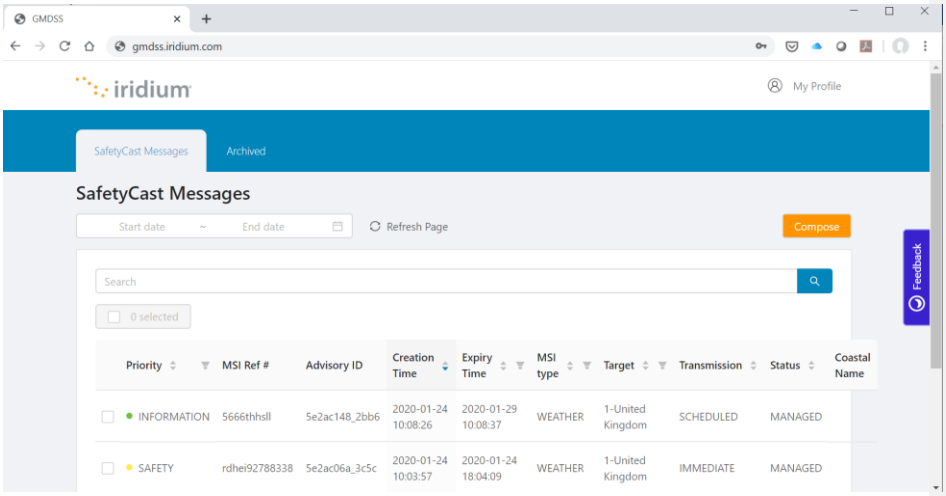

Figure 9c – SafetyCast Messages tab showing "Compose" button

6.4 When registered information providers need to transmit messages, they select "Compose" from the "SafetyCast Messages" tab shown in figure 9c above. This will trigger a "New Message" pop-up window, shown in figure 9d below. The registered information providers must complete the full set of fields in order for the "Send" button to become a selectable button.

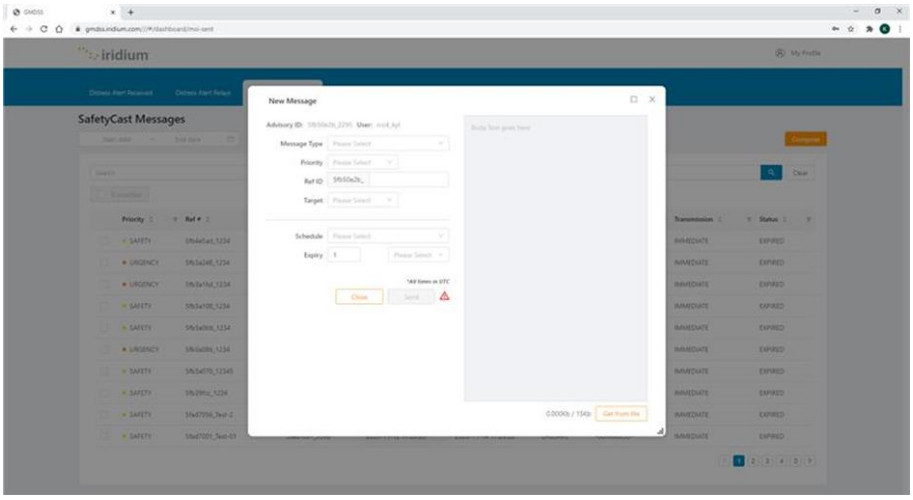

Figure 9d – New Message

6.5 Once the "Send" button is selected within the "New Message" window and the message has been accepted for transmission by the Iridium SafetyCast Service, a confirmation pop-up window will state "New Message Successful" as shown in figure 9e below.

Figure 9e – New message confirmation notice

6.6 SafetyCast messages that have been sent and scheduled are then displayed on the "SafetyCast Messages" tab as shown in figure 9f below.

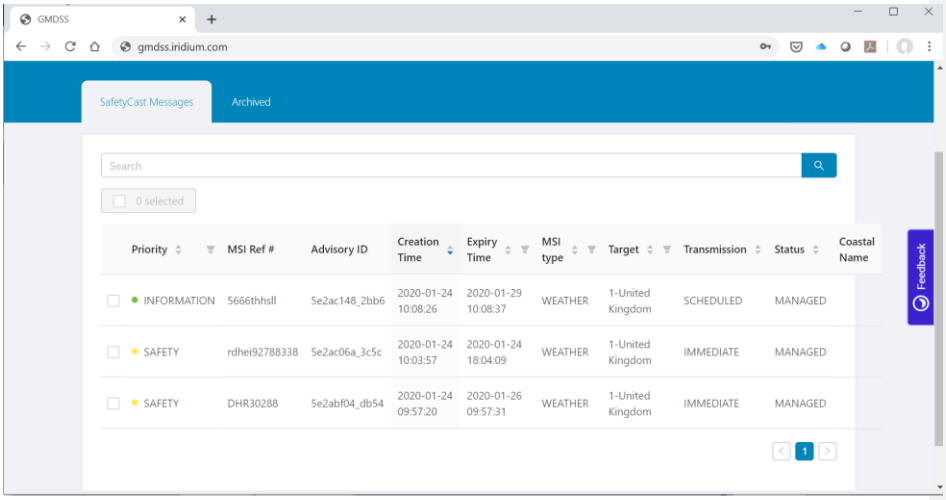

Figure 9f – SafetyCast Messages tab showing sent messages

6.7 Once a message has been submitted successfully by a registered information provider, the message details may be viewed by clicking anywhere on the summary line for that message within the "SafetyCast Messages" tab. The message details are shown in a pop-up as shown in figure 9g below.

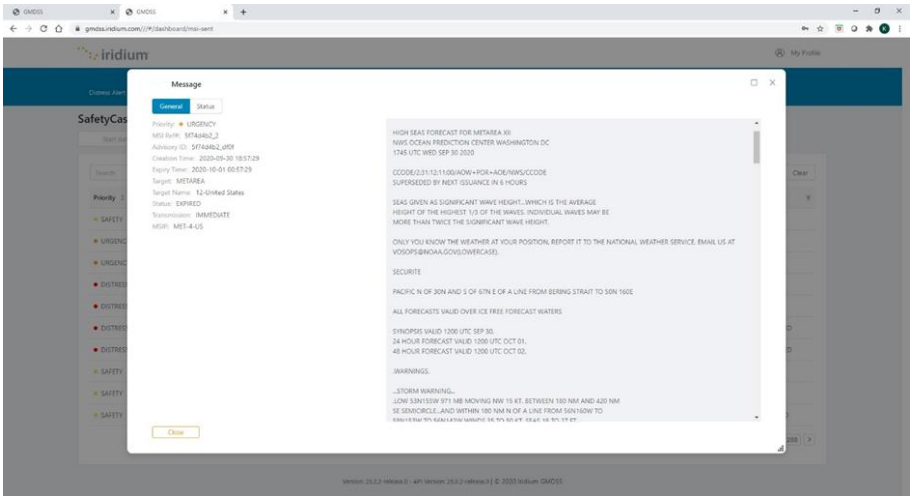

Figure 9g – Sample "Message Details" pop-up

6.8 Once a message has been sent via the satellite network, the status of the message can be viewed by selecting the "Status" button in the "Details" pop-up, as shown in figure 9h below.

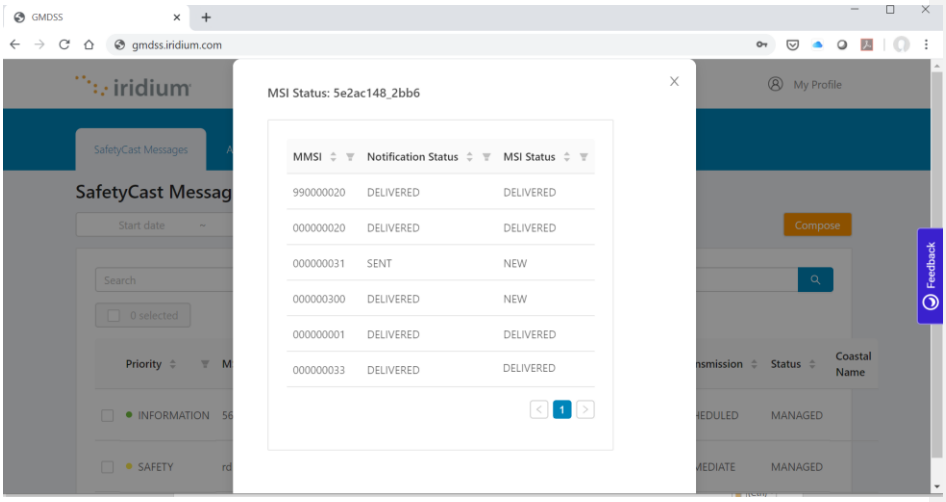

Figure 9h – Message status

6.9 SafetyCast messages may be archived to the "Archived" tab by selecting the message via the check box and selecting the "Archive" button that will appear on the "SafetyCast Messages" tab.

6.10 Messages that have been archived from the "SafetyCast Messages" tab are displayed on the "Archived" tab, as shown in figure 9i below.

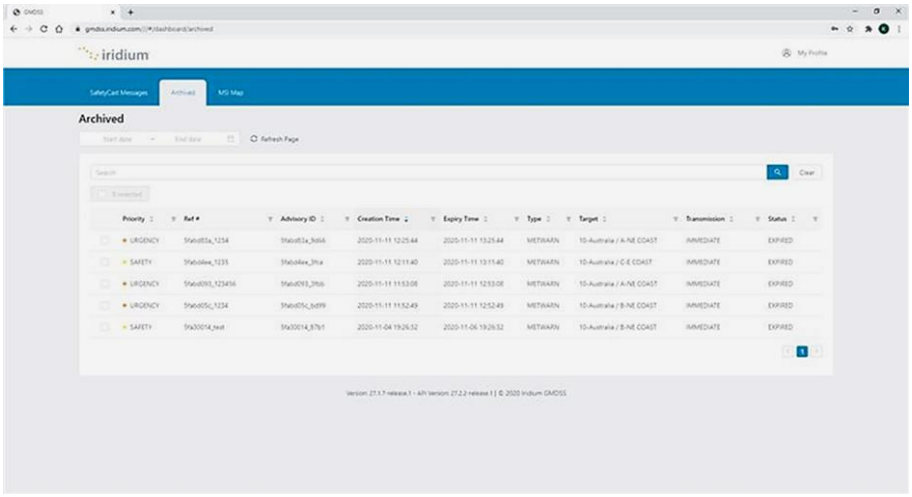

Figure 9i – Archived messages

6.11 Once a message has been archived that message moves to the "Archived" tab. To bring that message back to the "SafetyCast Messages" tab, the registered information provider checks the box next to the archived message and selects the "Restore" button that appears.

6.12 New messages may be addressed to a NAVAREA, METAREA or Coastal Warning Area or to a specific user-defined rectangular or circular area, as shown in figures 9j and 9k below.

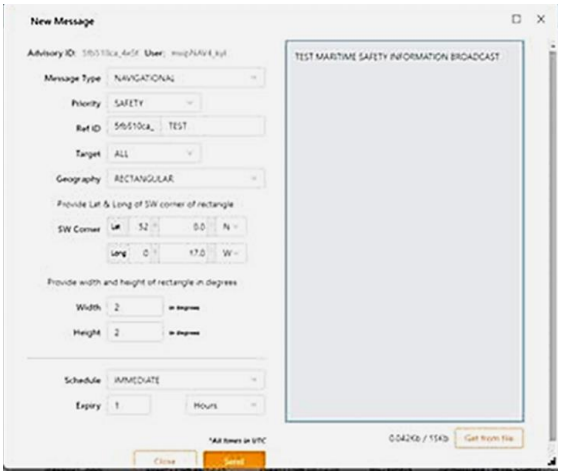

Figure 9j – Message addressed to a rectangular area

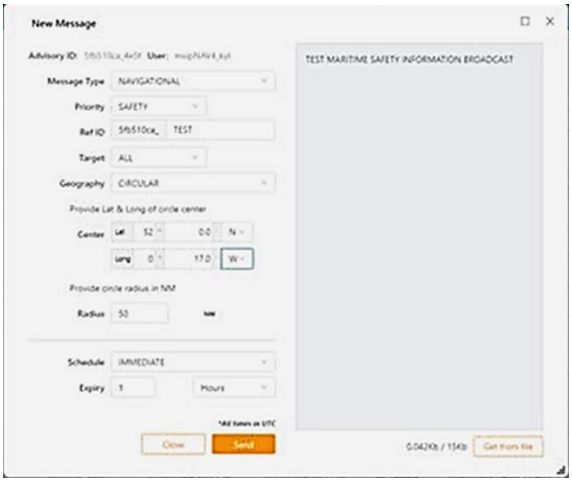

Figure 9k – Message addressed to a circular area

Additional guidance

7.1 Additional guidance for METAREA Coordinators is contained in resolution A.1051(27), as amended, *on Worldwide Met-Ocean Information and Warning Service*.

7.2 Additional guidance for NAVAREA Coordinators is contained in resolution A.706(17), as amended, *on World-Wide Navigational Warning Service*.

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7.3 Additional guidance for SAR Authorities is contained in the IAMSAR Manual, Volumes I and II.

7.4 Additional guidance on piracy countermeasures is contained in the *Guidelines on operational procedures for the promulgation of maritime safety information concerning acts of piracy and piracy counter-measure operations* (resolution MSC.305(87)).

Operational guidance – Part 2[14]

8 Part 2 contains operational guidance for using methods other than the web interface for accessing the Iridium SafetyCast service. Further detail on the availability and format of those interfaces is available by contacting Iridium at the contact details in given in section 4 of this Manual.

Use of the codes given in this appendix is mandatory for all messages in the system.

9 Types of messages and message formats are detailed in the sub-parts of this appendix:

Part A – Navigational warning service;
Part B – Meteorological service;
Part C – Search and Rescue (SAR) services and SAR coordination traffic;
Part D – Piracy countermeasures broadcast messages; and
Part E – Iridium SafetyCast interpretation of ~~R~~repetition codes (C_4).

Allocation of priority and services codes for EGC services		
Service	**Message priority**	**Service code (type)**
Navigational warning services	C_1 = 1 (Safety) – normally C_1 = 2 (Urgency) – exceptionally at discretion of information provider	C_2 = 04 – Navigational warning to a rectangular area C_2 = 13 – Coastal warning to a coastal warning area C_2 = 24 – Navigational warning to a circular area C_2 = 31 – NAVAREA warning to a NAVAREA
Meteorological services	C_1 = 1 (Safety) – always for forecasts and warnings C_1 = 2 (Urgency) – always for Beaufort Force 12 and above warnings only	C_2 = 04 – Meteorological warning or forecast to a rectangular area C_2 = 13 – Meteorological warning or forecast to a coastal warning area

[14] ~~Most of the original text for this Operational Guidance has been taken from the International SafetyNET Manual, with the exception of the final table describing Iridium's message expiry protocol with respect to Category A and B repetition codes. Therefore, some terms are contextual to Inmarsat technology. In the case of confusion, please contact Iridium at the contact details in given in Section 4 of this Manual, for clarification.~~

Allocation of priority and services codes for EGC services		
Service	**Message priority**	**Service code (type)**
		C_2 = 24 – Meteorological warning or forecast to a circular area C_2 = 31 – Meteorological warning or meteorological forecast to a METAREA
SAR services: 1) Shore-to-ship distress alert relays[15]	C_1 = 3 (Distress) – always	C_2 = 14 – Shore-to-ship distress alert relay to a circular area
2) SAR coordination traffic	C_1 = 1 (Safety) – determined by the phase of emergency C_1 = 2 (Urgency) – determined by the phase of emergency C_1 = 3 (Distress) – determined by the phase of emergency	C_2 = 34 – SAR coordination to a rectangular area C_2 = 44 – SAR coordination to a circular area
3) Shore-to-ship urgency and safety traffic	C_1 = 1 (Safety) C_1 = 2 (Urgency)	C_2 = 31 – Urgency and safety traffic
4) General (all ships call within the Inmarsat Ocean Region)	C_1 = 2 (Urgency) C_1 = 3 (Distress)	C_2 = 00
Piracy countermeasures broadcast messages	C_1 = 1 (Safety) C_1 = 2 (Urgency) – for piracy attack warnings	C_2 = 04 – Piracy warning to a rectangular area C_2 = 13 – Piracy warning to a coastal warning area C_2 = 24 – Piracy warning to a circular area C_2 = 31 – Piracy warning to a NAVAREA

[15] The original text, in the International SafetyNET Manual, refers to "distress alerts". This should be "distress alert relays" and will be corrected in a future edition of the SafetyNET Manual.

10 The broadcast parameters are controlled by the use of five (or six) C codes which are combined into a generalized message address header format, prescribed by Iridium. ~~as follows:~~

~~C_0:C_1:C_2:C_3:C_4:C_5~~

~~(*Spaces, colons or other delimiters between these codes will be required, depending on the communication protocol of the addressed LES.*)~~

C_0 – Ocean Region
C_1 – Message priority
C_2 – Service code
C_3 – Address code
C_4 – Repetition code
C_5 – Presentation code

Each C code controls a different broadcast parameter and is assigned a numerical value according to the options specified in the following parts.

The ~~additional~~ C_0 code is needed to maintain the structure of the protocol but is not used by the SafetyCast service, therefore any numeric from 0 to 9 can be entered. ~~will only be required to identify the satellite Ocean Region when sending a broadcast message to a LES which operates to more than one satellite Ocean Region, as follows:~~

~~C_0 = 0 – AOR-W~~
~~C_0 = 1 – AOR-E~~
~~C_0 = 2 – POR~~
~~C_0 = 3 – IOR~~
~~C_0 = 9 – All Ocean Regions~~[16]

11 ~~(a)~~ All EGC messages should comprise of three elements:

.1 address header instruction (EGC C codes);

.2 TEXT OF MESSAGE; and

.3 NNNN.

Mandatory message element table	
Message element	**Remarks**
Address header instruction	The syntax of the special address header in relation to the exact number of digits and/or alphanumeric characters, and to the spaces between each C code is critical, and must conform to the format required by the Iridium SafetyCast Service guides ~~LES or service provider as supplied in their specific instruction manual~~.

~~[16] Subject to availability through LES or service provider.~~

Message element	Remarks
TEXT OF MESSAGE	The content of the message should be presented in UPPER case. For maritime safety information messages, the format of navigational warnings, and meteorological warnings and forecasts, is defined in the *Joint IMO/IHO/WMO Maritime Safety Information Manual*, as amended.
NNNN	The letters NNNN should be inserted at the end of the text to indicate "end of message".

~~(b) EGC messages submitted for transmission (or broadcast) via a two-stage access system must also include an end of transmission instruction code for the LES. This should be inserted on the final line, after NNNN. This code may vary, and must conform to the format required by the LES or service provider as supplied in their specific instruction manual.~~

12 IMO requires that, in order to allow the use of non-dedicated receive facilities, the majority of broadcasts on the International EGC Service are made at scheduled times. Broadcast schedules must be coordinated through the IMO EGC Coordinating Panel, which can also offer advice on ways of scheduling information within the system.

13 Because errors in the header format of a message may prevent it being released, MSI and SAR related information providers must monitor broadcasts of messages which they originate.

14 For all the services described below, a cancellation or deleting ~~facility~~ capability is provided through the GUI~~for messages transmitted to an LES with category (b) repetition codes (see part E). Cancellation (or deletion) procedures may vary between different LESs or service providers. Detailed operational procedure is contained in the instructions on sending EGC broadcasts given to the MSI and SAR related information providers after registration with the LES operator or service provider~~.

~~15 The term "echo" used in all of the services described below in parts A, B, C and D is associated with using the respective C_4 repetition codes which will initiate an automatic repeated broadcast 6 minutes after the initial scheduled or unscheduled broadcast. The 6-minute repeat or echo is used to ensure that the warning is received by the maximum number of ships.~~

1~~5~~6 ~~Echo and repeat are not used by the Iridium system in the way that the Inmarsat system uses them. Instead they are replaced by the "expiry" function.~~ The Iridium SafetyCast system tracks the transmission and receipt of MSI broadcasts for each ship in the targeted area. ~~filters messages that have already been received by the Iridium SESs in the area targeted by the registered information provider.~~ C_4 codes are ~~converted~~ interpreted as described in part E, and users of the GUI need to set the expiry date and time. See also section 11.1 of this Manual and paragraphs 5.3 to 5.5 (Scheduling, ~~repetition~~ expiry and cancellation) of appendix 2, part 1, above.

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Appendix to appendix 2

Types of messages and message formats

Types of messages and message formats are detailed in the sub-parts of this appendix.

Part A – Navigational warning services

Part B – Meteorological services

Part C – Search and Rescue (SAR) services

Part D – Piracy countermeasures broadcast messages

Part E – Iridium SafetyCast interpretation of ~~R~~repetition codes (C4)

Part A – Navigational warning services

1 The following guidelines set out the arrangements to be used for promulgating navigational and coastal warnings for the GMDSS. **They are mandatory for broadcasts in the International EGC Service. Broadcasts originated by the International Ice Patrol also follow the guidelines in this part.**

2 These guidelines are to be read in conjunction with the *IMO/IHO World-Wide Navigational Warning Service (WWNWS) guidance document* (resolution A.706(17), as amended).

3 Navigational warnings that require an immediate broadcast should be transmitted as soon as possible after receipt. If still in force, they should be repeated in subsequent scheduled broadcasts, twice a day for 6 weeks or until cancelled.

4 Navigational warnings shall remain in force until cancelled by the originating Coordinator. Navigational warnings should be broadcast for as long as the information is valid; however, if they are readily available to mariners by other official means, for example in Notices to Mariners, then after a period of 6 weeks they may no longer be broadcast. If the navigational warning is still valid and not available by other means after 6 weeks, it should be reissued as a new navigational warning.

5 The following C codes shall be used for warnings issued under the auspices of the WWNWS.

5.1 C_1 – Message priority

C_1 = 1 (safety)
C_1 = 2 (urgency)(at discretion of the registered information provider)

5.2 C_2 – Service code[17]

C_2 = 04 Navigational warning to a rectangular area*
C_2 = 13 Coastal warning to a coastal warning area
C_2 = 24 Navigational warning to a circular area
C_2 = 31 NAVAREA warning to a NAVAREA

[17] C_2 = 04 may be used for NAVAREA warnings to a rectangular area by NAVAREAs XVII, XVIII, XIX, XX and XXI.

5.3 C_3 – Address code

C_3 = two digits X_1X_2	When C_2 = 31, then: X_1X_2 are the two digits of the NAVAREA number (with a leading zero where necessary in the range 01 – 21).
C_3 = four alphanumeric characters $X_1X_2B_1B_2$	When C_2 = 13 for Coastal warnings, then: X_1X_2 are the two digits of the NAVAREA number (with a leading zero where necessary in the range 01 – 21) B_1 is the coastal warning area A to Z B_2 is the subject indicator and must always be A or L, where: A = Navigational warnings L = Other navigational warnings
C_3 = twelve alphanumeric characters $D_1D_2LaD_3D_4D_5LoD_6D_7D_8D_9D_{10}$	When C_2 = 04 for NAVAREA warnings within a rectangular area: D_1D_2 is latitude of south-west corner of the rectangle in degrees La is hemisphere which will always be N for Arctic NAVAREAs XVII to XXI $D_3D_4D_5$ is longitude of south-west corner of rectangle in degrees, with leading zeros if required Lo is longitude E or W D_6D_7 is extent of rectangle in latitude (degrees) $D_8D_9D_{10}$ is extent of rectangle in longitude (degrees)
Example: a rectangle whose south-west corner is 60°N and 010°W, extending 30° north and 25° east, is coded as: 60N010W30025 Note: Latitude and longitude are limited by values from 00° to 90° latitude and 000° to 180° longitude.	

5.4 C_4 – Repetition code

C_4 = 01	May be used for initial unscheduled broadcast of NAVAREA warnings, and coastal warnings ~~with no echo~~ (transmit once on receipt, 1 hour expiry)
C_4 = 11	Recommended for use with initial unscheduled broadcast of NAVAREA warnings, and coastal warnings (transmit on receipt, 1 hour expiry ~~echo 6 minutes later~~)
C_4 = 16	Use for NAVAREA or coastal warnings scheduled for broadcast ~~twice per day at 12-hour intervals~~ with safety priority (Message available until cancelled)
Note: For NAVAREA or coastal warnings scheduled for broadcast more than twice per day, the appropriate C_4 repetition code detailed in part E of this Manual must be used.	

5.5 C_5 – Presentation code

C_5 = 00 The code 00 for International Alphabet Number 5 is normally used

Part B – Meteorological services

1 The following guidelines set out the arrangements to be used for promulgating meteorological forecasts and warnings for the GMDSS. **They are mandatory for broadcasts in the International EGC Service.**

2 These guidelines are to be read in conjunction with the IMO/WMO Worldwide Met-ocean Information and Warning Service (WWMIWS) Guidance Document, resolution A.1051(27) as amended, and in conjunction with the WMO Manual on Marine Meteorological Services (WMO No.558), as amended.

3 In order to ensure uniformity of meteorological forecasts and warnings globally, the following C codes should be used for meteorological services via EGC.

3.1 C_1 – Message priority

C_1 = 2 (urgency)	Only use for meteorological warnings with Beaufort force 12 or above
C_1 = 1 (safety)	For forecasts and other meteorological warnings

3.2 C_2 – Service code[18]

C_2 = 04	Meteorological warning or forecast to a rectangular area
C_2 = 13	Meteorological warning or forecast to a coastal warning area
C_2 = 24	Meteorological warning or forecast to a circular area

[18] C_2 = 04 may be used for METAREA warnings or meteorological forecasts to a rectangular area by METAREAs XVII, XVIII, XIX, XX and XXI.

C_2 = 31	Meteorological warning or forecast to a METAREA

3.3 **C_3 – Address code**

C_3 = ten alphanumeric characters $D_1D_2LaD_3D_4D_5LoR_1R_2R_3$	When C_2 = 24 for meteorological warnings to user-defined circular area, then: D_1D_2La (three characters) is latitude of centre in degrees, and La whether north (N) or south (S). A leading zero should be used for latitudes less than 10° $D_3D_4D_5$Lo (four characters) is longitude of centre in degrees, and Lo whether east (E) or west (W) of the prime meridian. One or two leading zeros should be used for longitudes less than 100° $R_1R_2R_3$ (three characters) is radius of circle in nautical miles, up to 999. One or two leading zeros should be used for radius less than 100 nm
Example: A circle centred at latitude 26°S longitude 54°W with radius of 70 nautical miles is coded as: 26S054W070	
C_3 = two digits XX	When C_2 = 31, for meteorological warnings or forecasts to a METAREA then: C_3 = the two digits of the METAREA number (with a leading zero where necessary in the range 01 – 21)
C_3 = four alphanumeric characters $X_1X_2B_1B_2$	When C_2 = 13 for meteorological warnings or forecasts to available predefined coastal warning areas, then: X_1X_2 are the two digits of the METAREA number (with a leading zero where necessary in the range 01 – 21). B_1 is the coastal warning area A to Z B_2 is the subject indicator and must always be B or E, where: B = Meteorological warnings E = Meteorological forecasts
C_3 = twelve alphanumeric characters $D_1D_2LaD_3D_4D_5LoD_6D_7D_8D_9D_{10}$	When C_2 = 04 for meteorological warnings or forecasts within a rectangular area D_1D_2 is latitude of south-west corner of the rectangle in degrees La is hemisphere N or S. $D_3D_4D_5$ is longitude of south-west corner of rectangle in degrees, with leading zeros if required Lo is longitude E or W

	D_6D_7 is extent of rectangle in latitude (degrees) $D_8D_9D_{10}$ is extent of rectangle in longitude (degrees)
Example: To cover Arctic METAREA XVIII, use a rectangle whose south-west corner is 67°N and 120°W, extending 23° north and 85° east, coded as: 67N120W23085 Note: Latitude and longitude are limited by values from 00° to 90° latitude and 000° to 180° longitude.	

3.4 **C_4 – Repetition code**

Category (a) repetition codes are used for meteorological services as follows:	
C_4 = 01	Use for meteorological forecast (transmit once on receipt, 1 hour expiry)
C_4 = 11	Use for meteorological warning (transmit on receipt, 1 hour expiry ~~followed by repeat 6 minutes later~~)
C_4 = 66	Due to the update frequency of 12 hour intervals for meteorological forecasts and warnings, an expiry period of 12 hours may also be appropriate (transmit once on receipt, 12 hour expiry)

3.5 **C_5 – Presentation code**

C_5 = 00 The code 00 for International Alphabet Number 5 is normally used

Part C – Search and Rescue services

1 The following guidelines set out the arrangements to be used by Rescue Coordination Centres (RCCs) for initiating transmission of shore-to-ship distress alert relays and shore-to-ship Search and Rescue information. Transmissions should be in accordance with the relevant procedures of the International Telecommunication Union (ITU) Radio Regulations (RR), the International Convention on Maritime Search and Rescue, 1979, as amended, and the IAMSAR Manual.

2 In order to ensure uniformity of the SAR broadcast product throughout the world, C codes should be used as described in this part.

3 Shore-to-ship distress alert relays

3.1 As a general principle, distress alert relays should be addressed to a circular area around the estimated or known position of the distressed vessel. The radius of the circle should be chosen to take account of the accuracy of the datum position, the expected density of shipping in the vicinity and the fact that the position can only be defined in the message address to the nearest whole degree of latitude and longitude. The distress alert relay message ~~must be~~ is automatically broadcast via all satellites which cover the area concerned. Shore-to-ship distress alert relays sent by the International EGC Service should contain the identification of the unit in distress, its approximate position and other information which might facilitate rescue. C codes should be as follows:

3.2 **C_1 – Message priority**

C_1 = 3 (distress)

3.3 **C_2 – Service code**

C_2 = 14 (shore-to-ship distress alert relay to circular areas)	Messages addressed to circular areas will only be received and printed out by EGC receivers that are located inside the circle

3.4 **C_3 – Address code**

C_3 = ten alphanumeric characters $D_1D_2LaD_3D_4D_5LoR_1R_2R_3$	When C_2 = 14 for distress alert relay to user-defined circular area, then: D_1D_2La (three characters) is latitude of vessel in distress in degrees (two digits) and whether north (N) or south (S): e.g. 39N (three characters total). A leading zero should be included for latitudes less than 10° $D_3D_4D_5Lo$ (four characters) is longitude of vessel in distress in degrees (three digits) and whether east (E) or west (W) of the prime meridian: e.g. 059W. A leading zero or zeros should be included for longitudes less than 100° or 10° as appropriate: e.g. use 099 for 99° and 008 for 8° $R_1R_2R_3$ (three characters) is alert relay radius around distressed vessel in nautical miles. To ensure that position inaccuracies of both the distressed vessel and nearby vessels to which the message is intended do not affect receipt of messages, radius values of 200 nautical miles or larger should normally be used. ~~Note that if a vessel's own position information is not entered into its SafetyNET receiver, every shore-to-ship distress alert relay message transmitted to the Inmarsat Ocean Region will be received and printed~~

3.5 **C_4 – Repetition code**

C_4 = 11	Use for distress alert relays (transmit on receipt, 1 hour expiry ~~followed by repeat 6 minutes later~~)

3.6 **C_5 – Presentation code**

C_5 = 00 The code 00 for International Alphabet Number 5 is normally used

4 General (all ships) call

4.1 When the RCC has no indication of the position of the vessel in distress, shore-to-ship distress alert relays may be sent as general call. This will be printed in every vessel within the Ocean Region.

Note: This method of alert relay should rarely be used.

The C_0:C_1:C_2:C_3:C_4:C_5 codes for general calls are always as follows:

C_0 = 0 (1, 2 or 3) (if required)
C_1 = 3 (distress) or 2 (urgency)
C_2 = 00
C_3 = 00
C_4 = 11
C_5 = 00

5 Search and Rescue coordination traffic

5.1 SAR coordination messages should be addressed to user-defined circular or rectangular areas for the intent of coordinating the search and rescue of a vessel in distress. Priority of the message will be determined by the phase of the emergency.

5.2 **C_1 – Message priority**

C_1 = 3 (distress), 2 (urgency) or 1 (safety)

5.3 **C_2 – Service code**

C_2 = 34	Search and Rescue coordination to a rectangular area
C_2 = 44	Search and Rescue coordination to a circular area

5.4 **C_3 – Address code**

C_3 = twelve alphanumeric characters $D_1D_2LaD_3D_4D_5LoD_6D_7D_8D_9D_{10}$	When C_2 = 34 Search and Rescue coordination to a rectangular area Note: The definition of 12 characters for a rectangular address is given in part A, paragraph 5.3
C_3 = ten alphanumeric characters $D_1D_2LaD_3D_4D_5LoR_1R_2R_3$	When C_2 = 44 Search and Rescue coordination to a circular area Note: The definition of 10 characters for a circular address is given in part B, paragraph 3.3

5.5 **C_4 – Repetition code**

C_4 = 11 Use for distress alert relays (transmit on receipt, 1 hour expiry ~~followed by repeat 6 minutes later~~)

5.6 **C_5 – Presentation code**

C_5 = 00 The code 00 for International Alphabet Number 5 is normally used

6 Shore-to-ship urgency and safety traffic

6.1 As a general principle, only the minimum information consistent with the safety of navigation should be broadcast. However, where such information is deemed essential,

shore-to-ship information other than distress alert relays should be broadcast to a NAVAREA using C codes as follows:

6.2 **C_1 – Message priority**

C_1 = 2 (urgency) or 1 (safety)

6.3 **C_2 – Service code**

C_2 = 31

6.4 **C_3 – Address code**

C_3 = two digits X_1X_2	When C_2 = 31, then: X_1X_2 are the two digits of the NAVAREA number (with a leading zero where necessary in the range 01-21)

6.5 **C_4 – Repetition code**

C_4 = 11	Use for unscheduled broadcasts of urgency and safety traffic (transmit on receipt, 1 hour expiry ~~followed by repeat 6 minutes later~~)

6.6 **C_5 – Presentation code**

C_5 = 00 The code 00 for International Alphabet Number 5 is normally used

7 SAR broadcast for overlapping satellite Ocean Regions

7.1 Search and Rescue distress and urgency broadcasts should be promulgated through all satellites serving the area surrounding the vessel in distress. This is to ensure that vessels with receivers tuned to any Ocean Region satellite serving the area will receive the message.

Part D – Piracy countermeasures broadcast messages

1 On receiving a message of alert or any other information concerning a threat of attack (from the Security Forces Authority responsible for the operational application of the urgency plans (countermeasures) in the region or another RCC, for example), the RCC should ask the NAVAREA coordinator (or any other competent authority in accordance with local arrangements), to send out a warning through the appropriate MSI network (NAVTEX or satellite) and other broadcasting networks for warnings to shipping, if these exist.

2 There are two kinds of MSI messages promulgated with respect to piracy countermeasures: the daily situation report (SITREP) and a piracy attack warning. Specific guidance on drafting and broadcasting these messages is given below.

3 The daily situation report should be broadcast at a regular time around 0800 local time daily. The following paragraphs provide specific guidance on broadcast procedures.

4 The daily situation report should be broadcast to a rectangular area enclosing the region of probable piracy attacks (based on historical data) plus a margin of 700 nautical miles (24 hours steaming by a fast ship) in every direction.

5 The following C codes illustrate those to be used for broadcasts of the daily SITREP:

5.1 **C_1 – Message priority**

C_1 = 1 (safety)

5.2 **C_2 – Service code**

C_2 = 04	SITREP to a rectangular area
C_2 = 24	SITREP to a circular area

5.3 **C_3 – Address code**

C_3 = twelve alphanumeric characters $D_1D_2LaD_3D_4D_5LoD_6D_7D_8D_9D_{10}$	When C_2 = 04 SITREP to a rectangular area Note: The definition of 12 characters for a rectangular address is given in part A, paragraph 5.3
C_3 = ten alphanumeric characters $D_1D_2LaD_3D_4D_5LoR_1R_2R_3$	When C_2 = 24 SITREP to a circular area Note: The definition of 10 characters for a circular address is given in part B, paragraph 3.3

5.4 **C_4 – Repetition code**

C_4 = 18	~~Broadcast every 24 hours (no echo)~~Message available until cancelled

5.5 **C_5 – Presentation code**

C_5 = 00 The code 00 for International Alphabet Number 5 is normally used

6 A piracy attack warning shall be broadcast as an "URGENT" NAVAREA or coastal warning immediately on receipt of the source information and at least at the next scheduled broadcast or for as long as the information remains valid. ~~In the area of overlap coverage from two or three Ocean Region satellites, urgent warnings will be broadcast over all satellites which cover the affected region.~~ Subject indicator character B_2 = L should be used in coastal warning areas. The specific area in which the attack has taken place is to be quoted in the first line of the text, using no more detail than is necessary to indicate the probable location of further attacks, e.g. WESTERN PHILIP CHANNEL or VICINITY HORSBURGH LIGHT. The description of the pirate vessel and its last observed movements are to be kept as brief as possible and should give only those details which are of significance in avoiding other attacks.

7 The following C codes illustrate those to be used for broadcast of piracy attack warnings:

7.1 **C_1 – Message priority**

C_1 = 2 (urgency)

7.2 **C_2 – Service code**

C_2 = 13	Coastal warning
C_2 = 31	NAVAREA warning

7.3 **C_3 – Address code**

C_3 = two digits X_1X_2	When C_2 = 31 then: X_1X_2 are the two digits of the NAVAREA number (with a leading zero where necessary in the range 01 to 21)
C_3 = four alphanumeric characters $X_1X_2B_1B_2$	When C_2 = 13 for coastal warnings then: X_1X_2 are the two digits of the NAVAREA number (with a leading zero where necessary in the range 01 to 21) B_1 is the coastal warning area A to Z B_2 is the subject indicator and must always be A or L, where: A = Navigational warnings L = Other navigational warnings

7.4 **C_4 – Repetition code**

C_4 = 16	~~Broadcast every 12 hours with no echo~~Message available until cancelled

7.5 **C_5 – Presentation code**

C_5 = 00 The code 00 for International Alphabet Number 5 is normally used

8 Date/time should always be quoted in the form:

DDHHMM UTC MoMoMo YY
as in the example: 251256 UTC JUN 17

Note: UTC (Coordinated Universal Time) is the same time-zone as GMT (Z).

9 Geographical positions should be quoted in the standard format:

$D_1D_2M_1M_2LaD_3D_4D_5M_3M_4Lo$

where:
D_1D_2 = degrees latitude (with leading zero if required)
M_1M_2 = minutes latitude
La = hemisphere (N or S)
$D_3D_4D_5$ = degrees longitude (with leading zeros if required)
M_3M_4 = minutes longitude
Lo = longitude (E or W)
as in the example: 5419N10327E

Notes:

1 Examples of format and drafting guidance for piracy warnings is contained in the *Joint IMO/IHO/WMO Manual on Maritime Safety Information* (MSC.1/Circ.1310, as amended, and IHO Publication No. S-53).

2 Decimals of minutes will seldom be necessary or appropriate for reports of this kind.

3 Where the name of a geographical feature is used instead of a geographical position, a name should be chosen that appears on all commonly used charts of the area. Local knowledge should not be required for understanding the message.

Part E – Iridium SafetyCast interpretation of ~~R~~r**epetition codes (C_4)**

1 The C_4 repetition codes are divided into two categories:

.1 Category (a) for messages that ~~are required to be repeated a finite number of times~~have an expiry time; and

.2 Category (b) for messages that are ~~required~~ available ~~to be repeated at specified intervals~~ until cancelled by the registered information provider up to a maximum of 1 year.

Note: The Iridium SafetyCast service uses a simplified interpretation of these repetition codes.

1.1 **Category (a) repetition codes:**

Code	Instruction
01	1 hour expiry~~transmit once on receipt~~
11	1 hour expiry~~transmit on receipt followed by repeat 6 minutes later~~
61	1 hour expiry ~~transmit on receipt and 1 hour after initial broadcast (twice)~~
62	2 hours expiry~~transmit on receipt and 2 hours after initial broadcast (twice)~~
63	3 hours expiry~~transmit on receipt and 3 hours after initial broadcast (twice)~~
64	4 hours expiry~~transmit on receipt and 4 hours after initial broadcast (twice)~~
66	12 hours expiry~~transmit on receipt and 12 hours after initial broadcast (twice)~~
67	24 hours expiry~~transmit on receipt and 24 hours after initial broadcast (twice)~~

70	24 hours expirytransmit on receipt, 12 hours after initial broadcast and then 12 hours after the second broadcast (three times)
71	48 hours expirytransmit on receipt, 24 hours after initial broadcast and then 24 hours after the second broadcast (three times)

1.2 **Category (b) repetition codes:**

A category (b) repetition code allows a message to be availablerepeated indefinitely or until cancelled by the message registered information provider up to a maximum of 1 year. The repetition period can be set at between 1 and 120 hours. In addition, each transmission can be echoed after a fixed period of 6 minutes. Repetition codes are made up by stating the multiplier first, followed by the delay period:

Multiplier x Delay

where the multiplier specifies the amount of delay periods between each broadcast, and the delay is a fixed number of hours. The **multiplier** digit may be any digit from 1 to 5 as follows:

1 = 1 specified delay period between broadcasts
2 = 2 specified delay periods between broadcasts
3 = 3 specified delay periods between broadcasts
4 = 4 specified delay periods between broadcasts
5 = 5 specified delay periods between broadcasts

The delay digit coding is as follows:

2 = 1 hour delay; no echo
3 = 1 hour delay; with echo
4 = 6 hours delay; no echo
5 = 6 hours delay; with echo
6 = 12 hours delay; no echo
7 = 12 hours delay; with echo
8 = 24 hours delay; no echo
9 = 24 hours delay; with echo

The various codembinations (Multiplier x Delay) available, are shown in the table below:

Code	Instruction
12	Message available until cancelledrepeat broadcast every 1 hour with no echo
13	repeat broadcast every 1 hour with an echo 6 minutes after each broadcast
22	repeat broadcast every 2 hours with no echo
23	repeat broadcast every 2 hours with an echo 6 minutes after each broadcast
32	repeat broadcast every 3 hours with no echo
33	repeat broadcast every 3 hours with an echo 6 minutes after each broadcast
42	repeat broadcast every 4 hours with no echo
43	repeat broadcast every 4 hours with an echo 6 minutes after each broadcast
52	repeat broadcast every 5 hours with no echo
53	
14	
15	
16 (or 24)	
17	

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Code	Instruction
(or 25) 34 35 18 (or 26; or 44) 19 (or 27; or 45) 54 55 36 37 28 (or 46) 29 (or 47) 56 57 38 39 48 49 58 59	~~repeat broadcast every 5 hours with an echo 6 minutes after each broadcast~~ ~~repeat broadcast every 6 hours with no echo~~ ~~repeat broadcast every 6 hours with an echo 6 minutes after each broadcast~~ ~~repeat broadcast every 12 hours with no echo~~ ~~repeat broadcast every 12 hours with an echo 6 minutes after each broadcast~~ ~~repeat broadcast every 18 hours with no echo~~ ~~repeat broadcast every 18 hours with an echo 6 minutes after each broadcast~~ ~~repeat broadcast every 24 hours with no echo~~ ~~repeat broadcast every 24 hours with an echo 6 minutes after each broadcast~~ ~~repeat broadcast every 30 hours with no echo~~ ~~repeat broadcast every 30 hours with an echo 6 minutes after each broadcast~~ ~~repeat broadcast every 36 hours with no echo~~ ~~repeat broadcast every 36 hours with an echo 6 minutes after each broadcast~~ ~~repeat broadcast every 48 hours with no echo~~ ~~repeat broadcast every 48 hours with an echo 6 minutes after each broadcast~~ ~~repeat broadcast every 60 hours with no echo~~ ~~repeat broadcast every 60 hours with an echo 6 minutes after each broadcast~~ ~~repeat broadcast every 72 hours with no echo~~ ~~repeat broadcast every 72 hours with an echo 6 minutes after each broadcast~~ ~~repeat broadcast every 96 hours with no echo~~ ~~repeat broadcast every 96 hours with an echo 6 minutes after each broadcast~~ ~~repeat broadcast every 120 hours with no echo~~ ~~repeat broadcast every 120 hours with an echo 6 minutes after each broadcast~~

~~**Note:** Not all codes may be provided by all service providers.~~

~~**Note:** The Iridium SafetyCast service operates a simplified version of these repetition codes, as illustrated below:~~

~~Category A~~

~~Code~~	~~Instruction~~
~~01~~	~~1 hour Expiry~~
~~11~~	~~1 hour Expiry~~
~~61~~	~~1 hour Expiry~~
~~62~~	~~2 hours Expiry~~

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63	3 hours Expiry
64	4 hours Expiry
66	12 hours Expiry
67	24 hours Expiry
70	24 hours Expiry
71	48 hours Expiry

Category B

Code	Instruction
12	Message runs until cancelled
13	
22	
23	
32	
33	
42	
43	
52	
53	
14	
15	
16 (or 24)	
17 (or 25)	
34	
35	
18 (or 26; or 44)	

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Code	Instruction
19 (or 27; or 45)	
54	
55	
36	
37	
28 (or 46)	
29 (or 47)	
56	
57	
38	
39	
48	
49	
58	
59	

"Cancelled" meaning time entered in "From" and "To" or "Cancel" fields.

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APPENDIX 3

Procedure for amending the Iridium SafetyCast service manual

1 Proposals for amendment or enhancement of the Iridium SafetyCast service manual should be submitted for evaluation by the Sub-Committee on Navigation, Communications and Search and Rescue (NCSR). Amendments should only be implemented after consideration and approval by the Maritime Safety Committee.

2 Amendments to the Manual should normally be approved at intervals of approximately ~~2~~ two years or at such longer periods as may be determined by the Maritime Safety Committee at the time of adoption. Amendments approved by the Maritime Safety Committee will be notified to all concerned, will provide at least 12 months notification and will become effective on 1 January of the following year~~., or at another date as decided by the Committee.~~

3 The agreement of the International Hydrographic Organization, the World Meteorological Organization, the International Mobile Satellite Organization and the active participation of other bodies should be sought, according to the nature of the proposed amendments.

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