Recognition of Iridium mobile satellite system as a GMDSS service provider

Submitted by IHB

SUMMARY

Executive Summary: This document provides additional details of the application for consideration of Iridium Satellite LLC to become a Global Maritime Distress and Safety System (GMDSS) mobile satellite services provider, which are relevant to WWNWS-SC

Action to be taken: Paragraph 2.

Related documents: MSC 94/9/3 dated 12 September 2014

1. See attached document.

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

INTERNATIONAL MARITIME ORGANIZATION

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MARITIME SAFETY COMMITTEE
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NAVIGATION, COMMUNICATIONS, SEARCH AND RESCUE

Response to concerns regarding Iridium mobile satellite system application as a GMDSS service provider

Submitted by the United States

SUMMARY

Executive summary:	This document responds to concerns raised at NCSR 1 regarding the application to recognize and use the Iridium mobile satellite system in the GMDSS
Strategic direction:	5.2
High-level action:	5.2.5
Planned output:	5.2.5.3
Action to be taken:	Paragraph 4
Related documents:	MSC 94/9; NSCR 1/28, NCSR 1/12 and NCSR 1/12/2

Introduction

1 This submission provides detailed information to allay concerns raised at NCSR 1 by the United Kingdom and others in the course of the discussion regarding the application to recognize and use the Iridium mobile satellite system in the GMDSS.

2 The Navigation, Communications and Search and Rescue Sub-Committee discussed documents NCSR 1/12 and NCSR 1/12/2, on the recognition of the Iridium mobile satellite system as a GMDSS service provider. The Sub-Committee concluded that additional information would need to be presented directly to the body, which is to conduct the technical and operational evaluation of Iridium's application, through the Secretariat, in order to address concerns expressed in document NCSR 1/12/2 as well as those expressed in paragraph 12.5.3 of the report of the Sub-Committee to the Committee. This submission provides that information for further delivery to the technical review body.

IMO CONVENTIONS EFFECTIVE IMPLEMENTATION

Discussion

3 Most of the concerns raised in NCSR 1/12/2 are met by understanding the unique architecture of the Iridium network and how its low-earth orbit constellation of satellites is operated. The remaining concerns raised in NCSR 1/12/1 are allayed by explanation of the limitations placed on an applicant and the requirements contained in the governing documents for submitting applications. All the concerns raised in document NCSR 1/12/2, as well as those raised by various delegations during the discussion at NSCR 1 as recorded in paragraph 12.5.3 of document NCSR 1/28, are addressed in detail in the annex.

Action requested of the Committee

4 The Committee is invited to note the information contained herein and is asked that it be provided to the Secretariat for further delivery to the relevant technical review body.

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ANNEX

RESPONSE TO CONCERNS RAISED IN DOCUMENT NCSR 1/12/2 (UNITED KINGDOM)

The following text addresses those concerns raised by the United Kingdom in NCSR 1/12/2 in the order in which they were presented in that document.

Restoration and spare satellites; Network availability

Deployment of a spare satellite to replace a failed satellite is not a prerequisite for restoring service to the affected area. The mobile nature of the Iridium constellation ensures that an adjacent satellite would move into range of the maritime mobile terminal within six minutes to restore communications. In the event of a service interruption due to a failed satellite, service would automatically be restored when a functioning satellite moved into range of the vessel. Resolution A.1001(25) states that service need be restored within one hour as a result of a partial or total satellite failure. The Iridium network complies with this requirement and will be able to continue to do so through the deployment of in-orbit spares, if required. In the extreme case deploying a spare satellite from one plane, which has an operational spare, to another orbital plane without a spare can take more than a year. Deploying a spare satellite within the same plane typically takes from two days to three weeks depending on the location of the failed satellite within the operational plane.

The United Kingdom statement that ITU document ITU-R M.828-1 is used as the methodology for the measurement for current GMDSS service providers is inaccurate. ITU-R M.828-1 is not the document of record used to establish how availability is calculated for service providers; ITU document ITU-R M.918-1 section 3.5 is used as the methodology for the measurement of availability.

ITU-R M.918-1 has a unique availability allocation for the terrestrial link from the ground earth station to the MRCC, for the space segment and for the mobile earth station. IMSO has stated that they do not monitor or include the links to the MRCCs in their availability calculations for Inmarsat services. In IMSO's calculations the availability performance for mobile earth stations is assumed to be 100%, as it is only measured for equipment at the MRCCs, which are not at sea and are not exposed to the same conditions as a shipboard terminal. Therefore, this demonstrates that the performance metrics collected and reported on by IMSO, of the Inmarsat recognized services, are exclusive to the performance of the space segment and ground earth station, which is congruent with the performance statistics Iridium provided in the application.

Resolution A.1001(25) establishes the requirements for the provision of mobile satellite services in the GMDSS system. Resolution A.1001(25) does not provide any requirements for the functionality or performance of the shipboard equipment. The United Kingdom document is correct in that Iridium shipboard equipment is not currently available for commercial sale. However, terminal equipment does exist that supports all of the described services and functionality, and will be able to demonstrate the proposed functionality.

Resolution A.1001(25) does not specifically define what is an outage, as all service interruptions are considered to be counted against the service availability. The term "impairment" in the application is used to describe a short-duration service outage that may result from a partial or total satellite failure. While a service interruption of 10 seconds, as used in documents such as recommendations ITU-R M.828-2 or M.918-1, is nearly impossible to detect for end-to-end communications services, Iridium understands that all service outages are expected to be included in the network availability and will calculate performance assuming these criteria.

Shore-to-ship broadcasting of Maritime Safety Information

Resolution A.1001(25) establishes the criteria for the broadcast distribution of Maritime Safety Information (MSI). Resolution MSC.306(87), as referenced in the United Kingdom document, is specific to the Enhanced Group Call equipment which supports the Inmarsat SafetyNET service. The desired capability as put forth by the United Kingdom is inconsistent with the requirements in resolution A.1001(25). Therefore, evidence to show how Iridium will satisfy capabilities that are not part of the requirements for the provision of mobile satellite GMDSS communications, as currently defined by A.1001(25), need therefore not be part of the application or the evaluation process. The term "SafetyNET" is a proprietary brand and trademark, implemented to satisfy the MSI broadcast requirement for the provision of mobile satellite GMDSS services. Resolution A.1001(25) clearly defines the requirements for support of MSI broadcasts, for which Iridium has described how it will meet the requirement and in fact has proposed to go beyond the stated requirements to emulate some of the incremental capabilities of the current broadcast service.

IMSO Public Service Agreement (PSA) and the provision of GMDSS services

The question whether Iridium would be able to commit to the five-year notice period required by the PSA, due to obligations relating to the operation of the satellites in orbit, is not relevant. In the agreement between the United States Government and Iridium, there is a provision that if more than four satellites do not possess sufficient fuel or functionality to properly de-orbit, the United States Government may exercise the authority to direct that satellites in the constellation which have been in operation for more than seven years be removed from orbit. The United States Government receives routine reports on the health status of the satellites and the constellation. The United States Government has no plan to direct Iridium to de-orbit any functioning satellites and impair their ability to provide GMDSS services. The terms of this agreement only apply to the current Iridium constellation, and are not applicable to the upcoming Iridium constellation, which will begin launching in 2015. It is common for governments in space-capable nations to have similar agreements in place with satellite operators. The United States Government can attest that Iridium will be able to clearly demonstrate that it can satisfactorily fulfill the five year notice period.

Additional concerns

There is no requirement in resolution A.1001(25) that a GMDSS mobile satellite service provider integrate their maritime mobile terminals or network with other satellite service providers. If this is desired, the Organization must further develop requirements, protocols and interfaces that all mobile satellite service providers and equipment support so as to enable integration among systems.

The current GMDSS requirements as defined in resolution A.1001(25) include the provision of voice communications for distress calls (see sections 3.1.1 and 3.1.6). The Iridium proposal demonstrates clearly how this requirement would be satisfied and that the equipment and service which will support this capability are currently in use in support of air traffic control communications. Shipboard variants of the current product are not yet commercially available, yet the products and services currently exist to demonstrate the service functionality and complete a detailed investigation.

The proposed implementation as to how Iridium will support manually initiated distress calls or alerts is detailed in the application. Iridium proposes to configure short codes to enable distress calls and messages to be directly routed to the appropriate MRCC(s). In the event an automatic connection cannot be established to the responsible MRCC, the call or alert message will be rerouted to an alternative MRCC. Resolution A.1001(25) defines a minimum

of four levels of priority that must be supported. The application is clear on how this is currently supported for voice and data communications. How this functionality is supported within the network is proprietary commercial information, due to the unique nature of the network, and it is not expected that Iridium will have to support protocols or processes implemented by other service providers.

As described in the Iridium application, upon authorization by the MSC to provide GMDSS services, Iridium will enable service packages for Iridium GMDSS users that will ensure billing policies that are in line with the requirements defined in resolution A.707(17). There is no requirement to implement such policies prior to authorization as the communications supported, by regulation, cannot be GMDSS communications and therefore are not applicable to resolution A.1001(25) and/or resolution A.707(17). How Iridium implements its commercial service packages is proprietary information, and providing greater detail to competitors would be detrimental to its commercial endeavors.

Response to concerns raised in discussion by NCSR 1

The following concerns were expressed by delegations during the discussion at NCSR 1 and were recorded in document NCSR 1/28 in paragraph 12.5.3 of the Report. They are addressed in turn:

Incompatibility of satellite systems and equipment requirements under SOLAS Chapter IV

The Iridium system, being truly global, will offer another way for ships to meet the requirements of SOLAS Chapter IV. The GMDSS is a "system of systems", but this does not affect the overall integrity or effectiveness of the GMDSS as a whole. As acknowledged by the Organization in its project to review the GMDSS, the GMDSS has "elements" and "procedures". Many of the elements are incompatible with each other in the sense that they are incapable of direct interoperability, but by applying the procedures of the GMDSS or other arrangements they may be indirectly interoperable. In addition, different elements may also achieve interoperability at the inter-network or inter-system level by the adoption of ITU-T standards, or similar. This is reflected in the requirements of resolution A.1001(25) relating to connections to the PSTN or PSDN. This indirect form of interoperability is also recognized in the IAMSAR Manual, volume I.

Additional requirements and equipment for SAR authorities and RCCs

Resolution A.1001(25) does not specify how a satellite system is connected to an MRCC or MRCCs, leaving these arrangements to be agreed by the administration(s) concerned. Some administrations already have national arrangements for their SAR authorities to receive calls or alerts through the Iridium system, and some use the system operationally themselves. In general, it will not be necessary for SAR authorities or RCCs to install hardware such as an Iridium terminal in order to receive alerts or calls, or to send relays or SAR coordination communications. Where new arrangements are necessary, the existing communication paths into an MRCC may prove suitable, alternatively the establishment of a VPN or similar arrangement would enable routing from the Iridium system to the RCC. For automatic routing from the associated RCC (or first RCC) to the responsible RCC, Iridium is consulting a number of RCCs, and is also exploring the use of existing infrastructure and protocols already put in place by administrations for the international routing of distress traffic. Initial assessment of the database of ships' identities, equipment and contact details described by resolution A.887(21) suggests that it will be straightforward to amend these details to include Iridium equipment.

Limitation of the network architecture with regard to the number of accesses to land stations which could affect the effective dissemination of information

The primary commercial gateway is the main link between the Iridium system, "external" networks such as the PSTN and the PSDN, and commercial service providers. The Iridium network teleports, commercial gateway, network operations centre and backup operations centre are located at geographically diverse locations in the United States, and are connected by redundant links to teleports. Every element in the system, proposed for the provision of GMDSS services, is supported by redundancy, with seamless switchover in the event of any failure. Access to the system is not dependent upon the number of earth stations and access to the system can be achieved from any location.

Costs associated with equipment acquisition and transmission of MSI messages, etc.

As described above, it will not be necessary for a SAR authority or MRCC to install an Iridium terminal. The cost of integrating the Iridium system into existing national systems will depend upon the specific requirements of those existing national systems. Similarly, it would not be necessary for an MSI provider to install an Iridium terminal in order to initiate the broadcast of MSI, but they may choose to do so for operational reasons related to monitoring their transmissions.

All satellite operators must apply the policy of resolution A.707(17) and upon recognition by the Organization, Iridium will launch new service packages to GMDSS users to ensure that these principles are applied. Iridium's proposals for charging are described in NCSR 1/12 in section 2.2.2.2 of the annex. Iridium has stated that it will comply fully with recommendations 1 and 2 of resolution A.707(17), and proposes that MSI providers would pay a fixed annual charge for access to the broadcast system, to cover all of their MSI broadcasts. Distress communications, also including distress relays and SAR broadcasts, urgent ship-to-shore danger reports and requests for medical assistance incur no charge.