IMPLEMENTATION OF THE RECOGNIZED GMDSS SERVICES BY IRIDIUM (agenda 3.3.3)

Submitted by the International Mobile Satellite Organization

SUMMARY

Executive Summary: This document provides information related to the implementation of the recognized GMDSS services by Iridium

Action to be taken: Paragraph 17

Related documents: NCSR 5/14/2, NCSR 5/23, MSC 99/12/7, MSC 99/22, MSC.1/Circ.1481, Resolution MSC.434(98), and Resolution A.1001(25).

1. Background

1.1 MSC 99 recognized the maritime mobile satellite services provided by Iridium – the "Iridium Safety Voice", "Short-Burst Data" and "Enhanced Group Calling" – for use in the GMDSS, and invited IMSO to monitor their implementation and report to the MSC when the Public Services Agreement with Iridium had been concluded and the Letter of Compliance had been issued.

1.2 This document lists the outstanding implementation issues that have been identified and need to be addressed before Iridium can be issued with the Letter of Compliance by IMSO.

2. SOLAS amendments to chapter IV

2.1 MSC 98 had approved draft amendments to chapter IV of, and the appendix to, the 1974 SOLAS Convention, replacing all references to "Inmarsat" with references to a "recognized mobile satellite service". These amendments should be deemed to have been accepted on 1 July 2019 and enter into force on 1 January 2020, in accordance with the Guidance on entry into force of amendments to the 1974 SOLAS Convention and related mandatory instruments (MSC.1/Circ.1481) (MSC 99/22 paragraph 3.18 refers).

2.2 Recognizing the fact that "maritime mobile terminal" is described by resolution A.1001(25) as an element of the recognized satellite system, and that no ships subject to SOLAS may use Iridium terminals to meet the requirements of the GMDSS before 1 January 2020, IMSO cannot issue the Letter of Compliance before 1 January 2020.

3 Type-approved Iridium maritime mobile terminal

3.1 SOLAS regulation IV/14 requires that equipment used to meet the requirements of chapter IV be "of a type approved by the Administration, and shall conform to performance standards not inferior to those adopted by the Organization". It was claimed during the assessment of Iridium that type approval cannot be granted formally until the system under consideration has been recognized by IMO; as by definition, the terminal must operate in a recognized system.

3.2 It is clear that type approval for the terminals must be obtained before the system becomes fully operational. Iridium, through US (MSC 99/12/7) expressed its commitment to obtain type approval for its GMDSS terminals prior to the proposed amendments to chapter IV of SOLAS entering into force on 1 January 2020.

3.3 Documentary evidence that Iridium terminal(s) have been issued with a type approval certificate by an Administration, or through one of its authorized entities, to verify its conformance with resolution MSC.434(98) is required as part of the implementation process.

4 Iridium GMDSS terminal design and installation guideline

4.1 Resolution MSC.434(98) on the performance standards for ship earth stations for use in the GMDSS invites IMSO to coordinate with the recognized GMDSS service providers, with a view to ensuring consistency between their ship earth station designs and installation guidelines and the performance standards specified in the annex to the present resolution.

4.2 In this respect, design and installation guidelines of the type-approved Iridium GMDSS terminal are required to be in place as part of the implementation process.

5 Iridium-specific MSI Manual

5.1 IMO has yet to develop a manual to describe the structure and operation of the Iridium enhanced group calling service for the promulgation of Maritime Safety Information (MSI), navigational and meteorological warnings, meteorological forecasts, Search and Rescue (SAR) information and other urgent safety-related messages to ships.

5.2 Approval of a generic, or Iridium-specific, MSI Manual by IMO to be used as a reference when overseeing the MSI broadcasting performance of Iridium is required as part of the implementation process.

6 Renaming the International SafetyNET Coordinating Panel

6.1 SafetyNET is a trademark of Inmarsat and refers to the MSI broadcasting service provided by Inmarsat. For this reason, renaming the International SafetyNET Coordinating Panel into a generic name is not only a comfort act, but it is also needed and required. It is noted during MSC 99 that IMO, IHO, WMO and IMSO were considering renaming the Panel as “the International EGC Coordinating Panel”.

6.2 Additionally, membership of the Panel should be expanded in a way to allow Iridium, and other providers recognized in the future, to be represented as observers on the Panel.

6.3 Renaming the International SafetyNET Coordinating Panel and expanding its membership to cover all recognized mobile satellite service providers is required as part of the implementation process.

7 Launching the Iridium Enhanced Group service

7.1 Promulgation of MSI, including SAR information and other urgent safety-related messages, to ships must be carried out by all mobile satellite service providers recognized by IMO under the coordination of the International SafetyNET Coordinating Panel (referred to as "the International EGC Coordinating Panel" hereinafter).

7.2 Existing authorized users of the Inmarsat SafetyNET service are expected to register with the Iridium system and obtain authorization to broadcast their messages through the Iridium Enhanced Group service simultaneously, unless a technical solution to support interoperability between all mobile satellite services by other means is developed and recognized by IMO. Regardless of what arrangement is made, MSI, including SAR information and other urgent safety-related messages, must be broadcast through all mobile satellite systems recognized by IMO that cover the target areas in question.

7.3 An official statement by the Chair of the International EGC Coordinating Panel confirming the operational readiness of the Iridium Enhanced Group service for promulgation of MSI, including SAR information and other urgent safety-related messages to ships is required as part of the implementation process.

8 Launching the Iridium Safety Voice service

8.1 The Iridium Safety Voice service can set up voice communications in the ship-to-shore, shore-to-ship and ship-to-ship directions with four levels of priority: 1-Distress; 2-Urgency; 3-Safety; and 4-Routine. Technical capability of the Iridium system in this respect was tested and verified during the assessment phase.

8.2 During the implementation of the Iridium Safety Voice service, Iridium must authorize responsible SAR entities, medical centres and hydrographic offices to receive/initiate voice communications from/to ships using type-approved Iridium GMDSS terminals. Means for identifying and verifying the credentials of these entities must be loaded into the user terminals so that the authorized entities are able to connect into the Iridium Gateway and initiate voice communications to type approved Iridium GMDSS terminals with the correct priority level according to their authorization type. To facilitate this, Iridium must assign a dedicated access number to be dialled in by authorized users for setting up priority 1-2-3 calls to ships via the Iridium Gateway.

8.3 Additionally, Iridium must assign another access number for setting up priority 4 calls to ships via the Iridium Gateway.

8.4 Extra care should be given when VoIP phones are used for dialling in to the Iridium Gateway access numbers and using the two-stage dialling process (NCSR 5/14/2, annex, paragraph 3.2.9 refers). Furthermore, advice from IMO may be needed on the use of the tenth digit of the ship station number on receiver display units as a priority indicator (NCSR 5/14/2, annex, paragraph 3.2.2 refers).

8.5 Documentation evidencing that the above issues have been resolved satisfactorily, and demonstrating them in operation, is required as part of the implementation process.

9 Availability

9.1 The complete network availability of the Iridium system, including ground and space assets, is expected to achieve at least 99.9% over any given year.

9.2 The network availability of the Iridium system between November 2016 and September 2017 was noted to be 99.983% for the Short-Burst Data service and 99.989% for the Safety Voice service. The space segment availability for the same period was measured as 99.37% as a result of persistent outages in the constellation at the time, which was ascribed to two, now decommissioned.

9.3 The network availability was reportedly increased to 99.97% and 100% in September and October 2017, respectively, as a direct consequence of the Iridium NEXT satellites launched and commissioned earlier.

9.4 The complete network availability of the Iridium system, including ground and space assets, must meet the required minimum standard (99.9%).

9.5 Documentation evidencing that the network availability over the most recent 12-month period was equal to or above 99.9% is required as part of the implementation process.

10 Spare satellite capacity

10.1 In the nominal Iridium constellation, after the NEXT project is complete, there will be 6 in-orbit spare satellites, which could be drifted in to the orbit within 18 to 28 days to replace a failed primary satellite.

10.2 Until that happens, the design, structure and operation of the Iridium constellation compensates for the failure of one of the primary satellites providing the recognized communication services. Depending on the latitude of the user, the length of service disruption could vary from zero for no more than [6] minutes at a time, to a temporary loss of the Safety Voice service. A similar delay may occur for the data communication services (Short-Burst Data and Enhanced Group Calling services).

10.3 Documentation evidencing deployment of 66 primary and 6 in-orbit spare satellites is required as part of the implementation process.

11 Hot back-up for Iridium Gateway

11.1 Although it is not directly specified in resolution A.1001(25), redundancy in the critical ground segment is undoubtedly a must-have feature of a recognized mobile satellite system. Having a known "single point of failure" in the provision of the recognized mobile satellite services is not acceptable.

11.2 Iridium, through US (MSC 99/12/7), has informed IMO that development of a GMDSS "hot backup" for its commercial gateway is planned and scheduled to be operational in 2019.

11.3 Commissioning and testing of a GMDSS "hot backup" facility providing physical and geographical redundancy for Iridium's "Tempe Gateway" is required as part of the implementation process.

12 Contingency exercises

12.1 IMSO had stated during the second phase of the assessment (NCSR 5/14/2, annex, paragraph 3.3.9) that the concept of contingency satellite exercises, as referred to in paragraph 3.6.2 of resolution A.1001(25), cannot be practically applied to the Iridium system which uses non-geostationary satellites. Instead, IMSO indicated that contingency exercises could be performed for other critical components of the Iridium system such as the gateway, teleports or Satellite Network Operation Centre (SNOC) to demonstrate restoration of the recognized services in less than one hour after a confirmed failure.

12.2 Development of procedures for restoration of the recognized services in the event of a critical system component failure is required as part of the implementation process.

13 Operational procedures

13.1 Iridium successfully explained and demonstrated its technical and operational capability to satisfy provisions of resolution A.1001(25) during the assessment phase.

13.2 In the next phase, the implementation, Iridium must develop internal operational procedures to manage and support its GMDSS operations. These procedures, as a minimum, should cover:

1. "Dashboard" notification system;
2. Contacting SAR users in case of a Distress Alert;
3. Contacting MSI providers and SAR users in case of a service outage;
4. Contacting IMSO in case of a service outage; and
5. Deployment of spare satellites.

14 Outcome of ITU WRC 2019

14.1 Referring to the absence of definitive regulatory protection in the ITU Radio Regulations for the interference-free use of the frequencies in use by Iridium to provide its services (absence of primary allocation of the space-to-Earth link), IMO NCSR Sub-Committee noted that as long as this work (i.e., protection of the frequencies in use by Iridium) in ITU had not been satisfactorily completed, Iridium could not become fully operational as a new GMDSS satellite service provider (NCSR 5/23, paragraph 14.42 refers).

14.2 Certainty that a sufficient and sustainable level of regulatory protection has been achieved for the frequencies in use by Iridium, in order to safeguard the recognized GMDSS services from any potential interference, is required as part of the implementation process.

15 Signing PSA

15.1 Signing a PSA with IMSO is a principal requirement for providers of mobile satellite systems recognized by IMO in the GMDSS.

15.2 The IMSO Assembly has delegated the Director-General the authority to negotiate and sign PSA with the recognized mobile satellite service Providers. According to the IMSO Convention, any signed PSA is subject to approval by the Assembly. For this reason, the Director General shall circulate the signed PSA to all Member States and unless 1/3 of the Member States objects to the PSA within 3 months, the PSA is considered as approved by the Assembly.

15.3 According to the PSA and revised IMSO Budget Arrangements, Iridium will be required to pay IMSO a fixed annual oversight fee at the time of issuing the Letter of Compliance.

15.4 Based on the above, signing and approval of the PSA with Iridium and payment of the relevant fixed oversight fee is required as part of the implementation process.

16 Oversight material

16.1 In accordance with the provisions of the PSA, Iridium shall provide IMSO with reasonable information pertaining to the recognized mobile satellite services in such form and with such frequency to be determined by IMSO in consultation with Iridium.

16.2 Additionally, a Public Services Committee (PSC) shall be established between IMSO and Iridium, which shall function according to written procedures jointly agreed between the two parties.

16.3 Agreement on the type, format and frequency of information to be made available to IMSO for performing the oversight of the Iridium recognized mobile satellite services and agreement of the procedures for the functioning of PSC is required as part of the implementation process.

17. Action requested of the Sub-Committee

The Sub-Committee is invited to note the information provided and consider them as it deems appropriate.