**WRC-19 Agenda Item 1.8**

IWG-1 members were not able to reach consensus on a proposal for WRC-19 Agenda Item 1.8 regarding the scope of modifications to No. **5.368** of the Radio Regulations. The differences focus on the application of radio regulation 4.10 and a desire to not constrain users in adjacent frequency bands. The views on the appropriate regulatory changes the FCC should support are provided.

View A is supported by: Iridium, Aviation Spectrum Resources, Inc., The Boeing Company, Harris, Wiltshire & Grannis, LLP, Jansky-Barmat Telecommunications, Inc. and Access Partnership, LLC.

View B is supported by: Inmarsat, Ligado Networks, and Globalstar.

VIEW A

**View A:**

WAC members supporting View A maintain that the WAC should approve Document IWG-1-026r2 AI 1-8 PP 9-29-17 (“Doc. 26”) and recommend to the FCC to use Doc. 26 as the basis for reconciling a draft United States Proposal for submission to the upcoming meeting of CITEL PCC.II.[[1]](#footnote-1) Iridium Satellite, LLC, The Boeing Company, Harris, Wiltshire & Grannis, LLP, Jansky-Barmat Telecommunications, Inc., Access Partnership, LLC, Aviation Spectrum Resources, Inc., support View A.

**Background**

Document IWG-1-026r2 is a draft proposal addressing Agenda Item 1.8 with respect to *resolves* 2 of Resolution **359 (WRC-15)** concerning the introduction of additional satellite systems into the GMDSS. The United States was the primary advocate of this WRC-19 Agenda Item.

To date, only one mobile satellite system has been recognized by the International Maritime Organization (IMO) for use in the GMDSS “system of systems”. Recognizing the need for additional satellite resources capable of providing increased coverage and competition for provision of maritime services, the International Maritime Organization is considering incorporation of additional satellite systems into the GMDSS**.** The IMO has taken action to facilitate the introduction of an additional satellite system into the GMDSS, and is considering the approval of the HIBLEO-2 (i.e., Iridium) satellite system for introduction into the GMDSS.[[2]](#footnote-2)

**Discussion**

A prerequisite to participating in the GMDSS is successfully completing a rigorous IMO approval process. Among other things, the IMO analyzes whether a system is sufficiently robust to support distress and safety communications. Without IMO approval, a system – existing or planned – cannot participate in the GMDSS.

For its role, through WRC-19, the International Telecommunication Union (“ITU”) will capture necessary changes to its Radio Regulations (“RR”) to recognize Iridium’s IMO approval to participate in the GMDSS. Because Iridium is an existing MSS system operating within the 1610-1626.5 MHz band for over 20 years, revisions to the RR to recognize GMDSS operation within this band, and consequential revisions for RR consistency, will be minimal. The View A proposal reflects a minimalist approach. In the View A proposal, the proposed revisions are:

* A footnote added to Article 5 for the band 1616-1626.5 MHz to recognize new frequencies for GMDSS satellite operations.
* Modifications to relevant parts of Appendix 15 of the RR to recognize new frequencies for GMDSS satellite operations.
* Modifications to relevant parts of Article 33 to recognize new frequencies for GMDSS satellite operations.

**IWG-1 Opposition**

In IWG-1 discussions proponents of View B have raised these issues (View A responses appear in italics after each point:

* Because GMDSS is used for distress and safety communications, identifying spectrum within the 1610-1626.5 MHz band for GMDSS would somehow confer “superprimary” status to Iridium’s secondary downlinks operating within the 1613.8-1626.5 MHz band.

*“Superprimary” is a made-up term that has no basis in the Radio Regulations. Allocation status is defined in Article 1 of the Radio Regulations.*

* Applying No. 4.10 only cautions administration to take care when assigning a station or frequency.

The application of applying 4.10 to GMDSS does not impact traffic priority. It reinforces to administrations that special care should be taken when assigning a station due to safety traffic. It acts to compliment No 1.59.

* *1.59 safety service: Any radiocommunication service used permanently or temporarily for the safeguarding of human life and property.*
* *4.10 Member States recognize that the safety aspects of radionavigation and other safety services require special measures to ensure their freedom from harmful interference; it is necessary therefore to take this factor into account in the assignment and use of frequencies.*
* The addition of a GMDSS designation could potentially change the interference relationships now existing between the 1613.8-1626.5 MHz and upper adjacent1626.5-1660 MHz band.

*The technical and operational characteristics of the Iridium satellite system will not change simply because the IMO approves Iridium for GMDSS carriage. With no change in the system, the interference relationships remain the same.*

* The United States Proposal should be limited to the 1618.725-1626.5 GHz band because:
  + The proposal as contained in the version proposed by Iridium is inconsistent with the current USA Table of Allocations and the band at 1616.0 MHz and does not conform to the ITU-R Table of Allocations; and
  + GMDSS operating below 1618 MHz would cause greater shipboard separation requirements between lower adjacent band GNSS receivers and GMDSS receivers operating from 1616-1626.5 MHz.

*With regard to sub-point one, the proposal is inconsistent with the referenced tables because the entire point of the proposal is to change the relevant Radio Regulations to reflect the IMO approval of GMDSS. Should WRC-19 adopt a proposal on GMDSS, at its option, the FCC can choose to implement RR changes into its domestic rules.*

Based on the points above, View B proponents (one of whom has been the *sole* provider of satellite GMDSS from the inception of GMDSS sat-com up to today) have developed their own counter-proposal that modifies the proponent’s View A proposal to:

* Add a footnote note to Article 5 of the RR to capture unprecedented (with respect to commercial services) nebulous adjacent band protection phraseology to be applied to GMDSS within the 1610-1626.5 MHz band;
* Limit the proposal to the band 1618.725-1626.5 – reflecting Iridium’s FCC authorization.
* Apparently conceding that No. 4.10 can be applied to Iridium’s downlink, limiting the application to 1618.725-1626.5 MHz – consistent with their GMDSS band limitation; and

**Proponent’s Proposal**

The Iridium MSS system has existed for 20 years and the addition of GMDSS does not change the technical and operational aspects of the system. Therefore, the relative regulatory and interference “position” of Iridium relative to systems operating in the same, or upper and lower adjacent bands, is not changed by the IMO approving carriage of GMDSS traffic over the Iridium’s satellite system, nor by WRC-19 capturing that fact by adopting appropriate changes to the RR. Therefore, minimal “regulatory” changes are required to capture IMO GMDSS approval in the RR.

Further, GMDSS is not a service as defined by the ITU. Thus, there are no new allocation issues to consider – the entirety of the 1610-1628.5 MHz band is already allocated to MSS.

For these reasons, the View A proponents drafted a minimalist proposal to capture IMO approval in the relevant sections of the RR. This minimalist approach is reflected in the attached View A proposal drafted by the proponent whose system the IMO is considering for GMDSS.

**Counter-Proposal of Opponents**

The View B proposal overcomplicates a straightforward matter. In many respects, even the “pared down” View B proposal appears to hijack the Agenda 1.8 agenda item for issues outside the scope of the agenda item itself.

First, the View B proposal would put new restraints on GMDSS traffic – which on the Iridium system is indistinguishable from other MSS traffic – to afford upper adjacent band operators (Inmarsat and Ligado) apparent new protection. This is bad precedent, and, moreover, any regulatory restrictions on secondary services is inherent in various provisions of the RR and it is unnecessary for repetition in an Article 5 footnote. If greater adjacent band protection is sought (unnecessary in Iridium’s view), it should be pursued elsewhere.

The limitation to individual licenses is counter to sound spectrum management principles. Generally, allocations and designations of applications within an allocation should be as broad and flexible as possible. Iridium’s initial proposal was to designate the entire band as available for GMDSS for MSS operators who pass IMO approval. However, due to concerns raised by the radio astronomy community and others, the proposal was pared back to the frequency range 1616-1626.5 MHz which aligns with the band referenced in Resolution **359 (WRC-15)**. Ultimately, as Iridium argues in IWG-1 deliberations, the proposal could evolve to accommodate developments in the ITU-R Working Parties addressing this matter, as well as the IMO.

Finally, as mentioned earlier, View B proponents appear to concede that No. 4.10 can be applied to GMDSS operations within the 1610-1626.5 MHz band. This is good because nowhere does the RR require a specific allocation status for a safety service. However, the above comment on frequency range applies here as well and the View A proponent advocates for applying No. 4.10 to GMDSS that may operate in the 1616-1626.5 MHz; not just to Iridium’s FCC authorization.

**Summary and Recommendation**

Two proposals are presented to address Agenda Item 1.8 concerning incorporating an additional satellite system into the GMDSS.

The first and original proposal is a minimalist one that attempts to incorporate an upcoming IMO decision on approving the Iridium satellite system to participate in the GMDSS. The proposal is minimalist because the approval to carry GMDSS traffic will not change the technical and operational characteristics of the Iridium system, nor will it change the relative regulatory status of other systems within the band, not in the upper and lower adjacent bands.

The second proposal, by competitors and opponents, is one that attempts to use Agenda Item 1.8 to capture in the RR new restrictions on Iridium operations, and also to limit flexibility in providing GMDSS – a critical safety of life at sea service.

The purpose of this draft United States Proposal is to begin to socialize the issue within CITEL PCC.II so that our regional WRC partners can assist in developing a regional position based on evolving events in the ITU-R Working Parties and in the IMO. Many of the CITEL countries have maritime interests and are awaiting developments on this Agenda Item 1.8 matter.

The proponent’s intention is to capture such developments in subsequent evolutions of this proposal. At this juncture, there is no need to overly restrict the proposal. Consequently, View A proponents recommend that the WAC adopt the View A proposal and reject the View B proposal.

**ATTACHMENT TO VIEW A:**

**UNITED STATES OF AMERICA**

**DRAFT PROPOSAL FOR THE WORK OF THE CONFERENCE**

**Agenda Item 1.8**: ​*to consider possible regulatory actions to support Global Maritime Distress and Safety Systems (GMDSS) modernization and to support the introduction of additional satellite systems into the GMDSS, in accordance with Resolution****359****(****Rev.WRC‑15****)*

**INTRODUCTION**: WRC-15 adopted agenda item 1.8 for WRC-19, which considers possible regulatory actions to support Global Maritime Distress and Safety Systems (GMDSS) modernization and to support the introduction of additional satellite systems into the GMDSS in accordance with Resolution **359 (Rev.WRC-15)**. This document proposes changes to the Radio Regulations to support the introduction of additional satellite systems into the GMDSS.

**BACKGROUND:** To date, only one mobile satellite system has been recognized by the International Maritime Organization (IMO) for use in the GMDSS “system of systems”. Advances in communications technology, the maturity of commercial satellite operations have introduced competition into the satellite sector, and the deployment of non-geostationary satellite constellations have led the IMO to identify recognition of additional satellite systems to the GMDSS as an urgent work item. Consequently, the IMO is considering incorporation of additional satellite systems into the GMDSS**.** Recognizing the need for additional satellite resources capable of providing increased coverage and competition for provision of maritime services, the IMO has taken action to facilitate the introduction of an additional satellite system into the GMDSS.

IMO’s Maritime Safety Committee (MSC) has considered the notification by the United States of America of the application of the Hibleo-2 mobile-satellite system for recognition and use in the GMDSS. Noting no objections in principle, the MSC referred the matter to IMO’s Sub-Committee on Navigation, Communications and Search and Rescue (NCSR) for evaluation.[[3]](#footnote-3) Recognizing general support of the application among administrations, the NCSR suggested to MSC options for undertaking a detailed technical and operational assessment of the Hibleo-2 application[[4]](#footnote-4). MSC subsequently directed that the International Mobile Satellite Organization (IMSO) should undertake the assessment of the Hibleo-2 mobile satellite system and provide a report for consideration by the NCSR Sub Committee.[[5]](#footnote-5)

IMSO has completed its report to the NCSR which, in turn, determined that the Hibleo-2 mobile satellite system could be incorporated into the GMDSS subject to compliance with a list of conditions. The NCSR invited the MSC to endorse this view, with the understanding that it, based on evaluation reports from IMSO, would advise the Committee on final recognition.[[6]](#footnote-6) The MSC subsequently endorsed the list of conditions to be complied with by the Hibleo-2 mobile satellite system.[[7]](#footnote-7) That action concluded a first stage review of the United States’ GMDSS application, with a statement that approval ("recognition") of the introduction of the Hibleo-2 mobile satellite system into the GMDSS can be made when the MSC-endorsed list of conditions are satisfied.

The IMO has also concluded an equipment performance standard applicable to new mobile satellite GMDSS services (resolution MSC 434(98) on *Performance standards for a ship earth station for use in the GMDSS*) and has agreed an amendment to its Safety of Life at Sea (SOLAS) Convention enabling new providers of mobile satellite GMDSS services.[[8]](#footnote-8) A final stage of evaluation is planned and IMSO’s findings will be reported to NCSR accordingly. It is expected that NCSR will recommend approval (recognition) of the system in 2018.[[9]](#footnote-9)

The IMO actions described above are intended to facilitate the timely introduction of an additional MSS system into the GMDSS. This proposal will modify the Radio Regulations to recognize the availability of the band 1 616-1 626.5 MHz for providing GMDSS by mobile satellite systems.

**Proposal**:

**MOD** USA/1.8/1

ARTICLE 5

**Frequency allocations**

**Section IV – Table of Frequency Allocations**

**1 610-1 660 MHz**

|  |  |  |
| --- | --- | --- |
| **Allocation to services** | | |
| **Region 1** | **Region 2** | **Region 3** |
| **1 610-1 610.6**  MOBILE-SATELLITE (Earth-to-space) 5.351A  AERONAUTICAL RADIONAVIGATION | **1 610-1 610.6**  MOBILE-SATELLITE (Earth-to-space) 5.351A  AERONAUTICAL RADIONAVIGATION  RADIODETERMINATION- SATELLITE (Earth-to-space) | **1 610-1 610.6**  MOBILE-SATELLITE (Earth-to-space) 5.351A  AERONAUTICAL RADIONAVIGATION  Radiodetermination-satellite (Earth-to-space) |
| 5.341 5.355 5.359 5.364  5.366 5.367 MOD 5.368 5.369  5.371 5.372 | 5.341 5.364 5.366 5.367  MOD 5.368 5.370 5.372 | 5.341 5.355 5.359 5.364 5.366 5.367 MOD 5.368 5.369 5.372 |
| **1 610.6-1 613.8**  MOBILE-SATELLITE (Earth-to-space) 5.351A  RADIO ASTRONOMY  AERONAUTICAL RADIONAVIGATION | **1 610.6-1 613.8**  MOBILE-SATELLITE (Earth-to-space) 5.351A  RADIO ASTRONOMY  AERONAUTICAL RADIONAVIGATION  RADIODETERMINATION-SATELLITE (Earth-to-space) | **1 610.6-1 613.8**  MOBILE-SATELLITE (Earth-to-space) 5.351A  RADIO ASTRONOMY  AERONAUTICAL RADIONAVIGATION  Radiodetermination-satellite (Earth-to-space) |
| 5.149 5.341 5.355 5.359 5.364 5.366 5.367  MOD 5.368 5.369  5.371 5.372 | 5.149 5.341 5.364 5.366  5.367 MOD 5.368 5.370 5.372 | 5.149 5.341 5.355 5.359 5.364 5.366 5.367  MOD 5.368 5.369  5.372 |
| **1 613.8-1 626.5**  MOBILE-SATELLITE (Earth-to-space) 5.351A  ADD 5.GMDSS  AERONAUTICAL RADIONAVIGATION  Mobile-satellite (space-to-Earth) ADD 5.GMDSS  5.208B | **1 613.8-1 626.5**  MOBILE-SATELLITE (Earth-to-space) 5.351A ADD 5.GMDSS  AERONAUTICAL RADIONAVIGATION  RADIODETERMINATION- SATELLITE (Earth-to-space)  Mobile-satellite (space-to-Earth) ADD 5.GMDSS  5.208B | **1 613.8-1 626.5**  MOBILE-SATELLITE (Earth-to-space) 5.351A  ADD 5.GMDSS  AERONAUTICAL RADIONAVIGATION  Mobile-satellite (space-to-Earth) ADD 5.GMDSS  5.208B  Radiodetermination-satellite (Earth-to-space) |
| 5.341 5.355 5.359 5.364 5.365 5.366 5.367  MOD 5.368 5.369  5.371 5.372 | 5.341 5.364 5.365 5.366  5.367 MOD 5.368 5.370 5.372 | 5.341 5.355 5.359 5.364 5.365 5.366 5.367  MOD 5.368 5.369  5.372 |
| **1 626.5-1 660** MOBILE-SATELLITE (Earth-to-space) 5.351A  5.341 5.351 5.353A 5.354 5.355 5.357A 5.359 5.362A 5.374  5.375 5.376 | | |

**Reason:** To reference new No. 5.GMDSS identifying the 1618.725-1626.5 MHz band to support the introduction of an additional satellite system into the GMDSS in accordance with Resolution **359 (Rev.WRC-15)**.

**ADD** USA/1.8/2

**5.GMDSS** The band 1616-1626.5 MHz may also be used for the provision of distress, urgency, and safety communications of the Global Maritime Distress and Safety System (GMDSS). (See Table **15-2** of Appendix **15**, No. **33.50** and No. **33.53** of Article **33**).

**Reason:** To identify the band 1616-1626.5 MHz as being available for the provision of GMDSS by mobile-satellite service systems.

**MOD** USA/1.8/3

**5.368** With respect to the radiodetermination-satellite service and the mobile-satellite services the provisions of No. **4.10** do not apply in the band 1 610-1626.5 MHz MHz, with the exception of the aeronautical radionavigation-satellite service and aeronautical mobile-satelite (route) service in the band 1610-1626.5 MHz, and the Global Maritime Distress and Safety System in the band 1616-1626.5 MHz.

**Reason:** To recognize that in the band 1616-1626.5 MHz the mobile-satellite service is used for the provision of aeronautical and maritime safety services. Consequently, No. 4.10 applies.

**MOD** USA/1.8/4

APPENDIX 15 (REV.WRC‑19)

**Frequencies for distress and safety communications for the Global  
Maritime Distress and Safety System (GMDSS)**

TABLE 15-2     (WRC‑15)

**Frequencies above 30 MHz (VHF/UHF)**

|  |  |  |
| --- | --- | --- |
| **Frequency (MHz)** | **Description of usage** | **Notes** |
| \*121.5 | AERO-SAR | The aeronautical emergency frequency 121.5 MHz is used for the purposes of distress and urgency for radiotelephony by stations of the aeronautical mobile service using frequencies in the frequency band between 117.975 MHz and 137 MHz. This frequency may also be used for these purposes by survival craft stations. Use of the frequency 121.5 MHz by emergency position-indicating radio beacons shall be in accordance with Recommendation ITU‑R M.690‑3.  Mobile stations of the maritime mobile service may communicate with stations of the aeronautical mobile service on the aeronautical emergency frequency 121.5 MHz for the purposes of distress and urgency only, and on the aeronautical auxiliary frequency 123.1 MHz for coordinated search and rescue operations, using class A3E emissions for both frequencies (see also Nos. **5.111** and **5.200**). They shall then comply with any special arrangement between governments concerned by which the aeronautical mobile service is regulated. |
| 123.1 | AERO-SAR | The aeronautical auxiliary frequency 123.1 MHz, which is auxiliary to the aeronautical emergency frequency 121.5 MHz, is for use by stations of the aeronautical mobile service and by other mobile and land stations engaged in coordinated search and rescue operations (see also No. **5.200**).  Mobile stations of the maritime mobile service may communicate with stations of the aeronautical mobile service on the aeronautical emergency frequency 121.5 MHz for the purposes of distress and urgency only, and on the aeronautical auxiliary frequency 123.1 MHz for coordinated search and rescue operations, using class A3E emissions for both frequencies (see also Nos. **5.111** and **5.200**). They shall then comply with any special arrangement between governments concerned by which the aeronautical mobile service is regulated. |
| 156.3 | VHF-CH06 | The frequency 156.3 MHz may be used for communication between ship stations and aircraft stations engaged in coordinated search and rescue operations. It may also be used by aircraft stations to communicate with ship stations for other safety purposes (see also Note *f* ) in Appendix **18**). |
| \*156.525 | VHF-CH70 | The frequency 156.525 MHz is used in the maritime mobile service for distress and safety calls using digital selective calling (see also Nos. **4.9**, **5.227**, **30.2** and **30.3**). |
| 156.650 | VHF-CH13 | The frequency 156.650 MHz is used for ship-to-ship communications relating to the safety of navigation in accordance with Note*k*) in Appendix **18**. |
| \*156.8 | VHF-CH16 | The frequency 156.8 MHz is used for distress and safety communications by radiotelephony. Additionally, the frequency 156.8 MHz may be used by aircraft stations for safety purposes only. |
| \*161.975 | AIS-SART VHF CH AIS 1 | AIS 1 is used for AIS search and rescue transmitters (AIS-SART) for use in search and rescue operations. |
| \*162.025 | AIS-SART VHF CH AIS 2 | AIS 2 is used for AIS search and rescue transmitters (AIS-SART) for use in search and rescue operations. |

TABLE 15-2 (*end*)     (WRC‑15)

|  |  |  |
| --- | --- | --- |
| **Frequency (MHz)** | **Description of usage** | **Notes** |
| \*406-406.1 | 406-EPIRB | This frequency band is used exclusively by satellite emergency position-indicating radio beacons in the Earth-to-space direction (see No. **5.266**). |
| 1 530-1 544 | SAT-COM | In addition to its availability for routine non-safety purposes, the band 1 530‑1 544 MHz is used for distress and safety purposes in the space-to-Earth direction in the maritime mobile-satellite service. GMDSS distress, urgency and safety communications have priority in this band (see No. **5.353A**). |
| \*1 544-1 545 | D&S-OPS | Use of the band 1 544-1 545 MHz (space-to-Earth) is limited to distress and safety operations (see No. **5.356**), including feeder links of satellites needed to relay the emissions of satellite emergency position-indicating radio beacons to earth stations and narrow-band (space-to-Earth) links from space stations to mobile stations. |
| 1616-1626.5 | SAT-COM | In addition to its availability for routine non-safety purposes, the band 1 616‑1 626.5 MHz is used for distress and safety purposes in the Earth-to-space and space-to-Earth directions in the maritime mobile-satellite service. GMDSS distress, urgency and safety communications have priority over non-safety communications within a satellite system (see No. **5.GMDSS)**. |
| \*1 645.5-1 646.5 | D&S-OPS | Use of the band 1 645.5-1 646.5 MHz (Earth-to-space) is limited to distress and safety operations (see No. **5.375**). |
| 9 200-9 500 | SARTS | This frequency band is used by radar transponders to facilitate search and rescue. |

|  |
| --- |
| **Legend**:  **AERO-SAR**     These aeronautical carrier (reference) frequencies may be used for distress and safety purposes by mobile stations engaged in coordinated search and rescue operations.  **D&S-OPS**     The use of these bands is limited to distress and safety operations of satellite emergency position-indicating radio beacons (EPIRBs).  **SAT-COM**     These frequency bands are available for distress and safety purposes in the maritime mobile-satellite service (see Notes).  **VHF-CH#**     These VHF frequencies are used for distress and safety purposes. The channel number (CH#) refers to the VHF channel as listed in Appendix **18**, which should also be consulted.  **AIS**    These frequencies are used by automatic identification systems (AIS), which should operate in accordance with the most recent version of Recommendation ITU‑R M.1371.     (WRC‑07)  \* Except as provided in these Regulations, any emission capable of causing harmful interference to distress, alarm, urgency or safety communications on the frequencies denoted by an asterisk (\*) is prohibited. Any emission causing harmful interference to distress and safety communications on any of the discrete frequencies identified in this Appendix is prohibited.     (WRC‑07)  **Reason:** To add the band 1618.725-1626.5 MHz as being available for distress and safety communications for the Global Maritime Distress and Safety System (GMDSS). |

**MOD** USA/1.8/5

**33.50** § 26 Maritime safety information may be transmitted via satellite in the maritime mobile-satellite service using the bands 1 530-1 545 MHz and 1 616-1 626.5 MHz. (see Appendix **15**).

**Reason:** To include the 1616-1626.5 MHz band as being available for transmitting maritime safety information via satellite.

**MOD** USA/1.8/6

**33.53** § 28 Radiocommunications for safety purposes concerning ship reporting communications, communications relating to the navigation, movements and needs of ships and weather observation messages may be conducted on any appropriate communications frequency, including those used for public correspondence. In terrestrial systems, the bands 415-535 kHz (see Article **52**), 1 606.5-4 000 kHz (see Article **52**), 4 000-27 500 kHz (see Appendix **17**), and 156‑174 MHz (see Appendix **18**) are used for this function. In the maritime mobile-satellite service, frequencies in the bands 1 530-1 544 MHz, 1616-1626.5 MHz, and 1 626.5-1 645.5 MHz are used for this function as well as for distress alerting purposes (see No. **32.2**).     (WRC‑07)

**Reason:** To apply No. 33.53 to the 1616-1626.5 MHz band for use by mobile-satellite service systems approved by the International Maritime Organization to participate in the Global Maritime Distress and Safety System.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

VIEW B

**VIEW B:**

IWG-1 members, Ligado Networks, Inmarsat and Globalstar, setting forth this view support efforts to facilitate the modernization of GMDSS—including through the introduction of a new GMDSS system. However, these members also share concerns raised at WRC-15 about the potential impact of such a new GMDSS system, operating in portions of the 1 610-1626.5 MHz band, on current and future operations by adjacent spectrum users and those in the same 1 610-1626.5 MHz band.

As discussed below, the IWG-1 members supporting View B have concluded that certain changes in the ITU Radio Regulations (RRs) proposed under View A are inappropriate and premature as drafted, particularly in light of the current secondary allocation for MSS downlink use of the 1 613.8-1626.5 MHz band segment. Instead, these members propose alternative language that would provide a path for the use of portions of that band segment by GMDSS satellite systems while making it clear that such systems may not adversely affect, or claim to be adversely affected by, spectrum uses in adjacent bands.

**Res. 359 Directs WRC-19 To Take Regulatory Actions with respect to GMDSS Modernization In a Manner that Is Compatible with Adjacent Spectrum Uses**

Res. 359 (and, by extension, AI 1.8) recognizes that any introduction of new GMDSS systems must be compatible with adjacent spectrum uses. Thus, Res. 359 provides for the introduction of new GMDSS systems if—and only if—two conditions are satisfied:

1. GMDSS satellite systems must fully protect existing services. Res. 359 explicitly recognizes that “GMDSS satellite systems need to provide protection of incumbent services in accordance with the Radio Regulations, including those in adjacent frequency bands, from harmful interference.”
2. GMDSS satellite systems must be capable of operating within the known interference environment, without any need to claim special protection from existing systems. Res. 359 explicitly recognizes that “GMDSS communications systems . . . must be resilient to interference” and “should operate within the interference environment of existing systems.”

Both conditions are designed to ensure that potential regulatory action under AI 1.8 provides GMDSS-related benefits *without* adversely affecting adjacent spectrum uses.

**Res. 359 Directs ITU-R to Complete Studies To Verify that these Conditions Are Satisfied**

Res. 359 calls for the completion of studies to evaluate the potential impact of GMDSS-related regulatory actions on adjacent spectrum uses. Such studies are to be conducted under the auspices of ITU-R, and must evaluate “the potential impact of possible modifications to the provisions of the Radio Regulations on sharing and compatibility with other services and systems in the frequency band and adjacent frequency bands.”

Res. 359 further establishes that action under AI 1.8 should be guided by the results of these studies. The resolution directs WRC-19 to: (i) “consider the result of [those] studies and ***take necessary actions, as appropriate***, to support GMDSS modernization” and (ii) “***consider regulatory provisions, if appropriate, based on the ITU-R studies*** . . . while ensuring the protection of all incumbent services, including those in adjacent frequency bands, from harmful interference . . . .” In short, Res. 359 treats the referenced studies as necessary inputs to any regulatory changes pursuant to AI 1.8.

Requisite studies have not been completed to evaluate the potential impact of GMDSS operations within that band on other services—which is particularly problematic given the evolving nature of systems and operations in that band and adjacent bands. While the proponents of View A assert that the ability to provide non-safety services within a portion of the 1 610-1626.5 MHz band today, including on a secondary basis, somehow ensures the compatibility of new GMDSS spectrum uses, this approach is inconsistent with the mandate of AI 1.8 and Res. 359.

**The Known Interference Environment Includes the Existing Secondary Allocation for MSS Downlinks at 1 613.8-1626.5 MHz**

Within the 1 610-1626.5 MHz band being considered for the introduction of a new GMDSS satellite system, the 1 613.8-1626.5 MHz segment is allocated for downlink operations (space-to-Earth) only on a secondary basis. The secondary nature of this allocation currently is not qualified in any manner, and does not include any references to the operation of GMDSS systems, their priority vis-à-vis other services or spectrum uses, or the application of No. 4.10 of the ITU RRs to any safety services or systems operated under this secondary allocation.

**The Changes Proposed under View B Avoid Potentially Harmful Impacts on Adjacent Spectrum Users under View A**

There are essentially five areas of disagreement between View A and View B:

### Frequency Range for GMDSS

#### View A would amend the ITU RRs to permit GMDSS operations in the entire 1 616-1626.5 MHz band (through the addition of a new No. 5.GMDSS to the ITU RRs).

#### In contrast, View B would amend the ITU RRs to permit GMDSS operations in the 1 618.725-1 626.5 MHz band—the actual band segment that has been proposed for use by a new GMDSS satellite system (which is consistent with the existing AMS(R)S authorization granted by the Commission to Iridium).

### Application of No. 4.10

#### View A would apply the provisions of No. 4.10 to GMDSS operations without qualification (through revisions to No. 5.368 of the ITU RRs). The absence of clarifying language, together with other changes proposed under this view, suggests that GMDSS would be entitled to certain protections vis-a-vis adjacent spectrum uses (including existing services). Particularly in the absence of any studies establishing the compatibility of GMDSS in the band with other spectrum uses, this suggestion is inconsistent with the mandate set forth in AI 1.8 and Res. 359, as discussed above.

#### In contrast, View B would make clear, through additional language in No. 5.368, that No. 4.10 would apply to the GMDSS only on an intra-system basis—*i.e.*, solely with respect to the prioritization of different spectrum uses by that GMDSS satellite system within that spectrum range (as opposed to on an inter-system basis). This is consistent with the proposed changes to Article 15 under View A.

### Modifications to Article 15 of the ITU RRs

#### View A would modify Table 15-2 to provide that GMDSS communications have certain priority without specifying the services or spectrum uses with respect to which such priority would exist.

#### In contrast, View B would add language to the modified Table 15-2 consistent with the modifications to No. 5.368 described above.

### Modifications to Address Aeronautical Mobile-Satellite (Route) Service (AMS(R)S)

#### View A would modify No. 5.368 to make No. 4.10 also apply to AMS(R)S provided at 1 610-1626.5 MHz, even though the FCC restricts AMS(R)S operation by Iridium to the 1 618.725-1626.5 MHz frequency band (see DA 16-875).

#### In contrast, View B would not address AMS(R)S in No. 5.368 because this is outside the scope of AI 1.8.

### Addition of Footnote Speculating as to the Outcome of Related International Maritime Organization (IMO) Processes

#### View A would add a footnote 7 to the United States submission cover page discussing the expected outcome of various IMO-related processes.

#### In contrast, View B would delete this footnote because it is inappropriate to speculate as to the outcome of these processes.

Another potential change that was proposed in the IWG was the inclusion of language in proposed No. 5.GMDSS explicitly providing, in light of the absence of studies and the secondary downlink allocation for MSS at 1 613.8-1626.5 MHz, that GMDSS operations may not constrain the development and use of services in adjacent frequency bands—*e.g.,* “GMDSS operations in this frequency band shall not constrain the development and use of the services operating in the adjacent frequency bands.”

During the IWG-1 process, certain stakeholders expressed concern about this language. Alternative language—*e.g.*, “A mobile earth station operating GMDSS services in this band shall be designed and installed as to tolerate the potential interference from MSS terminals operating in the adjacent bands. (WRC-19)”—was also proposed to address these concerns; however, no agreement was reached. While the parties supporting View B have sought to reach a compromise resolution by not including any modification to No. 5.GMDSS in the proposal, those parties agree that language proposed would clarify No. 5.GMDSS and address the compatibility of GMDSS operations with other services in adjacent bands.

The IWG-1 members supporting View B recognize the desire to facilitate the modernization of GMDSS—including through the introduction of a new GMDSS system. Pursuant to Res. 359, however, any such modernization must protect the operations in adjacent bands. The changes proposed in View B are a reasonable means of accomplishing both goals.

**ATTACHMENT TO VIEW B:**

**UNITED STATES OF AMERICA**

**DRAFT PROPOSAL FOR THE WORK OF THE CONFERENCE**

**Agenda Item 1.8**: ​*to consider possible regulatory actions to support Global Maritime Distress and Safety Systems (GMDSS) modernization and to support the introduction of additional satellite systems into the GMDSS, in accordance with Resolution****359****(****Rev.WRC‑15****)*

**INTRODUCTION**: WRC-15 adopted agenda item 1.8 for WRC-19, which considers possible regulatory actions to support Global Maritime Distress and Safety Systems (GMDSS) modernization and to support the introduction of additional satellite systems into the GMDSS in accordance with Resolution **359 (Rev.WRC-15)**. This document proposes changes to the Radio Regulations to support the introduction of additional satellite systems into the GMDSS.

**BACKGROUND:** To date, only one mobile satellite system has been recognized by the International Maritime Organization (IMO) for use in the GMDSS “system of systems”. Advances in communications technology, the maturity of commercial satellite operations have introduced competition into the satellite sector, and the deployment of non-geostationary satellite constellations have led the IMO to identify recognition of additional satellite systems to the GMDSS as an urgent work item. Consequently, the IMO is considering incorporation of additional satellite systems into the GMDSS**.** Recognizing the need for additional satellite resources capable of providing increased coverage and competition for provision of maritime services, the IMO has taken action to facilitate the introduction of an additional satellite system into the GMDSS.

IMO’s Maritime Safety Committee (MSC) has considered the notification by the United States of America of the application of the Hibleo-2 mobile-satellite system for recognition and use in the GMDSS. Noting no objections in principle, the MSC referred the matter to IMO’s Sub-Committee on Navigation, Communications and Search and Rescue (NCSR) for evaluation.[[10]](#footnote-10) Recognizing general support of the application among administrations, the NCSR suggested to MSC options for undertaking a detailed technical and operational assessment of the Hibleo-2 application.[[11]](#footnote-11) MSC subsequently directed that the International Mobile Satellite Organization (IMSO) should undertake the assessment of the Hibleo-2 mobile satellite system and provide a report for consideration by the NCSR Sub Committee.[[12]](#footnote-12)

IMSO has completed its report to the NCSR which, in turn, determined that the Hibleo-2 mobile satellite system could be incorporated into the GMDSS subject to compliance with a list of conditions. The NCSR invited the MSC to endorse this view, with the understanding that it, based on evaluation reports from IMSO, would advise the Committee on final recognition.[[13]](#footnote-13) The MSC subsequently endorsed the list of conditions to be complied with by the Hibleo-2 mobile satellite system.[[14]](#footnote-14) That action concluded a first stage review of the United States’ GMDSS application, with a statement that approval ("recognition") of the introduction of the Hibleo-2 mobile satellite system into the GMDSS can be made when the MSC-endorsed list of conditions are satisfied.

The IMO has also concluded an equipment performance standard applicable to new mobile satellite GMDSS services (resolution MSC 434(98) on *Performance standards for a ship earth station for use in the GMDSS*) and has agreed an amendment to its Safety of Life at Sea (SOLAS) Convention enabling new providers of mobile satellite GMDSS services.[[15]](#footnote-15) A final stage of evaluation is planned and IMSO’s findings will be reported to NCSR accordingly. It is expected that NCSR will recommend approval (recognition) of the system in 2018.

The IMO actions described above are intended to facilitate the timely introduction of an additional MSS system into the GMDSS. This proposal will modify the Radio Regulations to recognize the availability of the band 1 618.725-1626.5 MHz for providing GMDSS by mobile satellite systems.

**Proposal**:

**MOD** USA/1.8/1

ARTICLE 5

**Frequency allocations**

**Section IV – Table of Frequency Allocations**

**1 610-1 660 MHz**

|  |  |  |
| --- | --- | --- |
| **Allocation to services** | | |
| **Region 1** | **Region 2** | **Region 3** |
| **1 610-1 610.6**  MOBILE-SATELLITE (Earth-to-space) 5.351A  AERONAUTICAL RADIONAVIGATION | **1 610-1 610.6**  MOBILE-SATELLITE (Earth-to-space) 5.351A  AERONAUTICAL RADIONAVIGATION  RADIODETERMINATION- SATELLITE (Earth-to-space) | **1 610-1 610.6**  MOBILE-SATELLITE (Earth-to-space) 5.351A  AERONAUTICAL RADIONAVIGATION  Radiodetermination-satellite (Earth-to-space) |
| 5.341 5.355 5.359 5.364  5.366 5.367 MOD 5.368 5.369  5.371 5.372 | 5.341 5.364 5.366 5.367  MOD 5.368 5.370 5.372 | 5.341 5.355 5.359 5.364 5.366 5.367 MOD 5.368 5.369 5.372 |
| **1 610.6-1 613.8**  MOBILE-SATELLITE (Earth-to-space) 5.351A  RADIO ASTRONOMY  AERONAUTICAL RADIONAVIGATION | **1 610.6-1 613.8**  MOBILE-SATELLITE (Earth-to-space) 5.351A  RADIO ASTRONOMY  AERONAUTICAL RADIONAVIGATION  RADIODETERMINATION-SATELLITE (Earth-to-space) | **1 610.6-1 613.8**  MOBILE-SATELLITE (Earth-to-space) 5.351A  RADIO ASTRONOMY  AERONAUTICAL RADIONAVIGATION  Radiodetermination-satellite (Earth-to-space) |
| 5.149 5.341 5.355 5.359 5.364 5.366 5.367  MOD 5.368 5.369  5.371 5.372 | 5.149 5.341 5.364 5.366  5.367 MOD 5.368 5.370 5.372 | 5.149 5.341 5.355 5.359 5.364 5.366 5.367  MOD 5.368 5.369  5.372 |
| **1 613.8-1 626.5**  MOBILE-SATELLITE (Earth-to-space) 5.351A  ADD 5.GMDSS  AERONAUTICAL RADIONAVIGATION  Mobile-satellite (space-to-Earth) ADD 5.GMDSS  5.208B | **1 613.8-1 626.5**  MOBILE-SATELLITE (Earth-to-space) 5.351A ADD 5.GMDSS  AERONAUTICAL RADIONAVIGATION  RADIODETERMINATION- SATELLITE (Earth-to-space)  Mobile-satellite (space-to-Earth) ADD 5.GMDSS  5.208B | **1 613.8-1 626.5**  MOBILE-SATELLITE (Earth-to-space) 5.351A  ADD 5.GMDSS  AERONAUTICAL RADIONAVIGATION  Mobile-satellite (space-to-Earth) ADD 5.GMDSS  5.208B  Radiodetermination-satellite (Earth-to-space) |
| 5.341 5.355 5.359 5.364 5.365 5.366 5.367  MOD 5.368 5.369  5.371 5.372 | 5.341 5.364 5.365 5.366  5.367 MOD 5.368 5.370 5.372 | 5.341 5.355 5.359 5.364 5.365 5.366 5.367  MOD 5.368 5.369  5.372 |
| **1 626.5-1 660** MOBILE-SATELLITE (Earth-to-space) 5.351A  5.341 5.351 5.353A 5.354 5.355 5.357A 5.359 5.362A 5.374  5.375 5.376 | | |

**Reason:** To reference new No. 5.GMDSS identifying the 1618.725-1626.5 MHz band to support the introduction of an additional satellite system into the GMDSS in accordance with Resolution **359 (Rev.WRC-15)**.

**ADD** USA/1.8/2

**5.GMDSS** The band 1 618.725-1626.5 MHz may also be used for the provision of distress, urgency, and safety communications of the Global Maritime Distress and Safety System (GMDSS). (See Table **15-2** of Appendix **15**, No. **33.50** and No. **33.53** of Article **33**).

**Reason:** To identify the band 1618.725-1626.5 MHz as being available for the provision of GMDSS by mobile-satellite service systems.

**MOD** USA/1.8/3

**5.368** With respect to the radiodetermination-satellite service and the mobile-satellite services the provisions of No. **4.10** do not apply in the band 1610-1626.5 MHz MHz, with the exception of the aeronautical radionavigation-satellite service in that band, and with the exception of the Global Maritime Distress and Safety System in the band 1 618.725-1626.5 MHz to which No. **4.10** applies only with respect to the assignment to, and use of frequencies on, the satellite system operating in the relevant portion of the band 1 618.725-1626.5 MHz band and comprising such GMDSS system.

**Reason:** To recognize that in the band 1618.725-1626.5 MHz the mobile-satellite service is used for the provision of maritime safety services, and that the application of No. **4.10** to maritime safety services or systems in this frequency band shall not be used to constrain services operating in adjacent frequency bands over other systems.

**MOD** USA/1.8/4

APPENDIX 15 (REV.WRC‑19)

**Frequencies for distress and safety communications for the Global  
Maritime Distress and Safety System (GMDSS)**

TABLE 15-2     (WRC‑15)

**Frequencies above 30 MHz (VHF/UHF)**

|  |  |  |
| --- | --- | --- |
| **Frequency (MHz)** | **Description of usage** | **Notes** |
| \*121.5 | AERO-SAR | The aeronautical emergency frequency 121.5 MHz is used for the purposes of distress and urgency for radiotelephony by stations of the aeronautical mobile service using frequencies in the frequency band between 117.975 MHz and 137 MHz. This frequency may also be used for these purposes by survival craft stations. Use of the frequency 121.5 MHz by emergency position-indicating radio beacons shall be in accordance with Recommendation ITU‑R M.690‑3.  Mobile stations of the maritime mobile service may communicate with stations of the aeronautical mobile service on the aeronautical emergency frequency 121.5 MHz for the purposes of distress and urgency only, and on the aeronautical auxiliary frequency 123.1 MHz for coordinated search and rescue operations, using class A3E emissions for both frequencies (see also Nos. **5.111** and **5.200**). They shall then comply with any special arrangement between governments concerned by which the aeronautical mobile service is regulated. |
| 123.1 | AERO-SAR | The aeronautical auxiliary frequency 123.1 MHz, which is auxiliary to the aeronautical emergency frequency 121.5 MHz, is for use by stations of the aeronautical mobile service and by other mobile and land stations engaged in coordinated search and rescue operations (see also No. **5.200**).  Mobile stations of the maritime mobile service may communicate with stations of the aeronautical mobile service on the aeronautical emergency frequency 121.5 MHz for the purposes of distress and urgency only, and on the aeronautical auxiliary frequency 123.1 MHz for coordinated search and rescue operations, using class A3E emissions for both frequencies (see also Nos. **5.111** and **5.200**). They shall then comply with any special arrangement between governments concerned by which the aeronautical mobile service is regulated. |
| 156.3 | VHF-CH06 | The frequency 156.3 MHz may be used for communication between ship stations and aircraft stations engaged in coordinated search and rescue operations. It may also be used by aircraft stations to communicate with ship stations for other safety purposes (see also Note *f* ) in Appendix **18**). |
| \*156.525 | VHF-CH70 | The frequency 156.525 MHz is used in the maritime mobile service for distress and safety calls using digital selective calling (see also Nos. **4.9**, **5.227**, **30.2** and **30.3**). |
| 156.650 | VHF-CH13 | The frequency 156.650 MHz is used for ship-to-ship communications relating to the safety of navigation in accordance with Note*k*) in Appendix **18**. |
| \*156.8 | VHF-CH16 | The frequency 156.8 MHz is used for distress and safety communications by radiotelephony. Additionally, the frequency 156.8 MHz may be used by aircraft stations for safety purposes only. |
| \*161.975 | AIS-SART VHF CH AIS 1 | AIS 1 is used for AIS search and rescue transmitters (AIS-SART) for use in search and rescue operations. |
| \*162.025 | AIS-SART VHF CH AIS 2 | AIS 2 is used for AIS search and rescue transmitters (AIS-SART) for use in search and rescue operations. |

TABLE 15-2 (*end*)     (WRC‑15)

|  |  |  |
| --- | --- | --- |
| **Frequency (MHz)** | **Description of usage** | **Notes** |
| \*406-406.1 | 406-EPIRB | This frequency band is used exclusively by satellite emergency position-indicating radio beacons in the Earth-to-space direction (see No. **5.266**). |
| 1 530-1 544 | SAT-COM | In addition to its availability for routine non-safety purposes, the band 1 530‑1 544 MHz is used for distress and safety purposes in the space-to-Earth direction in the maritime mobile-satellite service. GMDSS distress, urgency and safety communications have priority in this band (see No. **5.353A**). |
| \*1 544-1 545 | D&S-OPS | Use of the band 1 544-1 545 MHz (space-to-Earth) is limited to distress and safety operations (see No. **5.356**), including feeder links of satellites needed to relay the emissions of satellite emergency position-indicating radio beacons to earth stations and narrow-band (space-to-Earth) links from space stations to mobile stations. |
| 1 618.725-1626.5 | SAT-COM | In addition to its availability for routine non-safety purposes, the band 1618.725‑1626.5 MHz is used for distress and safety purposes in the Earth-to-space and space-to-Earth directions in the maritime mobile-satellite service. GMDSS distress, urgency and safety communications have priority over non-safety communications within the satellite system providing such GMDSS communications (see No. 5.GMDSS). |
| \*1 645.5-1 646.5 | D&S-OPS | Use of the band 1 645.5-1 646.5 MHz (Earth-to-space) is limited to distress and safety operations (see No. **5.375**). |
| 9 200-9 500 | SARTS | This frequency band is used by radar transponders to facilitate search and rescue. |

|  |
| --- |
| **Legend**:  **AERO-SAR**     These aeronautical carrier (reference) frequencies may be used for distress and safety purposes by mobile stations engaged in coordinated search and rescue operations.  **D&S-OPS**     The use of these bands is limited to distress and safety operations of satellite emergency position-indicating radio beacons (EPIRBs).  **SAT-COM**     These frequency bands are available for distress and safety purposes in the maritime mobile-satellite service (see Notes).  **VHF-CH#**     These VHF frequencies are used for distress and safety purposes. The channel number (CH#) refers to the VHF channel as listed in Appendix **18**, which should also be consulted.  **AIS**    These frequencies are used by automatic identification systems (AIS), which should operate in accordance with the most recent version of Recommendation ITU‑R M.1371.     (WRC‑07)  \* Except as provided in these Regulations, any emission capable of causing harmful interference to distress, alarm, urgency or safety communications on the frequencies denoted by an asterisk (\*) is prohibited. Any emission causing harmful interference to distress and safety communications on any of the discrete frequencies identified in this Appendix is prohibited.     (WRC‑07)  **Reason:** To add the band 1618.725-1626.5 MHz as being available for distress and safety communications for the Global Maritime Distress and Safety System (GMDSS).  **MOD** USA/1.8/5  **33.50** § 26 Maritime safety information may be transmitted via satellite in the maritime mobile-satellite service using the band 1 530-1 545 MHz and 1618.725-1626.5 MHz. (see Appendix **15**).  **Reason:** To include the 1618.725-1626.5 MHz band as being available for transmitting maritime safety information via satellite.  **MOD** USA/1.8/6  **33.53** § 28 Radiocommunications for safety purposes concerning ship reporting communications, communications relating to the navigation, movements and needs of ships and weather observation messages may be conducted on any appropriate communications frequency, including those used for public correspondence. In terrestrial systems, the bands 415-535 kHz (see Article **52**), 1 606.5-4 000 kHz (see Article **52**), 4 000-27 500 kHz (see Appendix **17**), and 156‑174 MHz (see Appendix **18**) are used for this function. In the maritime mobile-satellite service, frequencies in the bands 1 530-1 544 MHz, 1618.725-1626.5 MHz, and 1626.5-1 645.5 MHz are used for this function as well as for distress alerting purposes (see No. **32.2**).     (WRC‑07)  **Reason:** To apply No. 33.53 to the 1 618.725-1626.5 MHz band for use by mobile-satellite service systems approved by the International Maritime Organization to participate in the Global Maritime Distress and Safety System. |

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1. The next meeting of CITEL PCC.II is planned for November 27 to December 1, 2017; Barranquilla, Colombia. [↑](#footnote-ref-1)
2. The IMO is well along in its review and approval process. The HIBLEO-2 satellite system has already surpassed significant IMO milestones. Going forward, by February 2018 we anticipate that the Navigation, Communications Search and Rescue (NCSR) will conduct a second stage evaluation of the HIBLEO-2 application to assess compliance with remaining IMO requirements. If the NCSR determines all requirements have been met, we anticipate that the NCRS will inform the Maritime Safety Committee (MSC) of successful completion and, by May 2018, we anticipate that MSC will issue a resolution recognizing the HIBLEO-2 system a GMDSS service provider. [↑](#footnote-ref-2)
3. MSC 92-26, “Report of the Maritime Safety Committee at its Ninety-second Session”, 30 June 2015, p 41-42. [↑](#footnote-ref-3)
4. MSC 94-9-2, “Note by the Secretariat: Evaluation of the Iridium Mobile Satellite System”, 3 September 2014. [↑](#footnote-ref-4)
5. MSC 94-21, “Report of the MSC on its Ninety Fourth Session”, 26 November 2014, p 36-37. [↑](#footnote-ref-5)
6. NCSR 3-29, “Report to the Maritime Safety Committee”, 22 March 2016, p 19-22. [↑](#footnote-ref-6)
7. MSC 96-25, “Report of the Maritime Safety Committee at its 96th Session”, 31 May 2016, p 61. [↑](#footnote-ref-7)
8. MSC 98-23, “Report of the Maritime Safety Committee on its Ninety-Eighth Session”, 28 June 2017. [↑](#footnote-ref-8)
9. Specifically, by February 2018 we anticipate that the Navigation, Communications Search and Rescue (NCSR) will conduct a second stage evaluation of the HIBLEO-2 application to assess compliance with remaining IMO requirements. If the NCSR determines all requirements have been met, we anticipate that the NCRS will inform the Maritime Safety Committee (MSC) of successful completion and, by May 2018, we anticipate that MSC will issue a resolution recognizing the HIBLEO-2 system a GMDSS service provider. [↑](#footnote-ref-9)
10. MSC 92-26, “Report of the Maritime Safety Committee at its Ninety-second Session”, 30 June 2015, p 41-42. [↑](#footnote-ref-10)
11. MSC 94-9-2, “Note by the Secretariat: Evaluation of the Iridium Mobile Satellite System”, 3 September 2014. [↑](#footnote-ref-11)
12. MSC 94-21, “Report of the MSC on its Ninety Fourth Session”, 26 November 2014, p 36-37. [↑](#footnote-ref-12)
13. NCSR 3-29, “Report to the Maritime Safety Committee”, 22 March 2016, p 19-22. [↑](#footnote-ref-13)
14. MSC 96-25, “Report of the Maritime Safety Committee at its 96th Session”, 31 May 2016, p 61. [↑](#footnote-ref-14)
15. MSC 98-23, “Report of the Maritime Safety Committee on its Ninety-Eighth Session”, 28 June 2017. [↑](#footnote-ref-15)