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| Summary: | | |
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| Proposal: | | |
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DRAFT CEPT BRIEF ON AGENDA ITEM 1.8

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

# ISSUE

Resolution 359 (WRC-15) also invites the WRC-19 to

consider the result of ITU Radiocommunication Sector (ITU-R) studies and take necessary actions, as appropriate, to support GMDSS modernization;

and consider regulatory provisions, if appropriate, based on the ITU-R studies, and taking into consideration the activities of IMO, related to the introduction of additional satellite systems into the GMDSS, including consideration of the MSS allocations used, while ensuring the protection of all incumbent services, including those in adjacent frequency bands, from harmful interference.

These two invites the WRC-19 has been identified for the CPM Report as two different issues

# Preliminary CEPT position

Issue A: Modernisation of GMDSS

CEPT supports the introduction of the MF frequencies for international NAVDAT, defined in the Recommendation ITU-R M.2010-0, in RR Article 5.

CEPT opposes the introduction of the MF frequencies for international NAVDAT, defined in the Recommendation ITU-R M.2010-0, in RR Appendix 15 for this WRC.

CEPT supports the introduction of the HF NAVDAT frequencies, defined in the Recommendation ITU-R M.2058-0, in RR Appendix 17.

CEPT opposes the introduction of the HF NAVDAT frequencies, defined in the Recommendation ITU-R M.2058-0, in RR Appendix 15 for this WRC.

Issue B: Regulatory action due to the introduction of additional satellite systems into the GMDSS by IMO

CEPT supports regulatory actions to introduce an additional satellite system into the GMDSS as follows:

the frequency band 1621.35-1626.5 MHz used for GMDSS is allocated to the maritime mobile satellite service (for both space-to-Earth and Earth-to-space) on a primary basis

Regulatory provisions are amended as necessary in order to ensure the protection of services operating in the frequency bands concerned and in adjacent frequency bands is maintained.

# Background

Issue A:

WRC-12 designated some frequency bands in RR Appendix 17 for digitally modulated emissions in the maritime mobile service (e.g. as described in the most recent version of Recommendation ITU-R M.1798) from 1st January, 2017 by footnote p). ITU-R issued Recommendation ITU-R M.2058-0 in February, 2014. Six channels respectively within 4 MHz, 6 MHz, 8 MHz, 12 MHz, 16 MHz and 22 MHz frequency bands with footnote p) are recommended to use for HF NAVDAT.

It is feasible technically. However, there are needs to take appropriate actions to give NAVDAT application regulatory status to operate in these bands. Furthermore, just as the same as the MF NAVDAT, the further protection approaches on HF bands need to be considered during the implementation of GMDSS modernization depending on the situation related to NAVDAT recognized in GMDSS, and the related coordination scheme developed. This is also planned to be done in study cycle of WRC-23, according to the progress of activities of IMO. A first action could be achieved at WRC-19 consisting of introducing these HF NAVDAT frequencies in RR Appendix 17.

Issue B:

There is a continuing need in the Global Maritime Distress and Safety System (GMDSS), on a global basis, for improved communications to enhance maritime capabilities. It is also related to enhancement of maritime safety in polar Arctic and Antarctic waters. Such maritime safety enhancement in the GMDSS can be achieved by the continued usage of GSO satellite networks along with the addition of non-GSO satellite networks to extend the GMDSS functions to near polar areas. One system using GSO and non-GSO systems networks (COSPAS SARsat) is already providing some GMDSS functions in the polar area. The International Maritime Organization (IMO) in May 2018 has recognised an existing satellite system (Iridium) as part of the GMDSS, and consequential regulatory actions may need to be considered. CEPT agreed that any new GMDSS satellite systems need to provide enhancement of maritime safety, through redundancy or the addition of new functionality while ensuring the protection of incumbent services in accordance with the Radio Regulations, including those in adjacent frequency bands, from harmful interference, and such GMDSS satellite systems operate within the interference environment of existing systems. ITU-R studies are being conducted on the 1616-1626.5 MHz MSS allocations, considering Nos 5.341, 5.359, 5.364, 5.365, 5.366, 5.367, 5.368, 5.369 and 5.372 that provide information on the use of the frequency band 1 616-1 626.5 MHz (or parts thereof), the activities of IMO and the recognition of additional satellite systems for use in the GMDSS, including consideration of the MSS allocations used and 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 to support GMDSS modernization.

The frequencies for distress and safety communications for the GMDSS are listed in Appendix 15 (AP15) (Rev.WRC-12) of the Radio Regulations, although the 1616-1626.5 MHz band is not currently included. These frequencies in Appendix 15 are allocated on a primary basis to the mobile service, including the maritime mobile, aeronautical mobile, and mobile satellite services. Distress alerts and distress traffic are considered to fall under the definition of the safety service. Safety services require special measures to ensure a reliable communication and their freedom from harmful interference (see RR No. 4.10). No 31.2 states that any emission causing harmful interference to distress and safety communications on any of the “discrete frequencies” identified in RR Appendix 15 is prohibited, but it is unclear how this relates to frequency bands. This raised the question of whether a secondary allocation could be included in Appendix 15. Taking into account the safety aspects of GMDSS, CEPT decided to adopt the proposal for the new GMDSS frequency band to be allocated on a primary basis.

Since 1998 the radio astronomy service (RAS) in the 1 610.6-1 613.8 MHz band has been experiencing harmful interference from MSS operations in the adjacent band 1 613.8-16 26.5 MHz, despite the application of No 5.372. This interference has been reported to the ITU and is also documented in the form of ECC Reports (171 and 226). Replacement satellites are expected to resolve this interference, and CEPT is monitoring their deployment in order to verify the necessary improvements.

In CEPT, ECC/DEC/(09)02 provides the necessary provisions for the harmonization of the frequency bands 1 610-1 626.5 MHz and 2 483.5-2 500 MHz for MSS systems.

The frequency band 1 626.5-1 645.5 MHz is adjacent to the band used by Iridium. This band is allocated to the MSS (Earth-to-space) and is identified as available for the GMDSS through RR No. 5.353A and Appendix 15. This band is used for the uplinks from MESs operating in GSO MSS systems, including the Inmarsat GSO MSS system which is the current GMDSS satellite communication system recognised by IMO. The use of this band by Inmarsat for provision of GMDSS services will continue irrespective of whether Iridium is accepted as a GMDSS provider. There is potential for interference to be caused by the transmitters in Inmarsat terminals, which include ship earth stations, to the receivers in Iridium terminals, which can occur if Inmarsat and Iridium terminals are used on the same ship or on different ships in close proximity. Compatibility between radio and navigation systems on board ships is addressed in IMO Resolution MSC.434(98), “Performance Standards for a Ship Earth Station for use in the GMDSS”, which inter alia recommends: “In case of multiple ship earth stations operating on adjacent frequency bands, the antenna should be installed such as to ensure electromagnetic compatibility.”

Resolution 359 (Rev.WRC-15) considering e) states that GMDSS satellite systems should operate within the interference environment of existing systems. If the band 1610-1626.5 MHz is identified in the RR for GMDSS - whether part of a primary or secondary MSS allocation - the current regulatory status between GSO MSS uplinks and Iridium downlinks should be maintained.

# List of relevant documents

ITU-Documentation (Recommendations, Reports, other)

* Recommendation ITU-R M.1184-2: “Technical characteristics of mobile satellite systems in the frequency bands below 3 GHz for use in developing criteria for sharing between the mobile-satellite service (MSS) and other services” (ITU-R Question 201/8)
* Recommendation ITU-R M.1188-1: “Impact of propagation on the design of non-GSO mobile-satellite systems not employing satellite diversity which provide service to handheld equipment” (ITU-R Question 88/8)
* Recommendation ITU-R M.1583-1: “Interference calculations between non-geostationary mobile-satellite service or radionavigation-satellite service systems and radio astronomy telescope sites” (ITU-R Question 236/8)
* Report ITU-R [M.2369-0](http://www.itu.int/pub/R-REP-M.2369): “Use of non-geostationary orbit mobile satellite systems to enhance maritime safety”
* Recommendation ITU-R RA.769-2: “Protection criteria used for radio astronomical measurements”
* Recommendation ITU-R RA.1513-1, “Levels of data loss to radio astronomy observations and percentage-of-time criteria resulting from degradation by interference for frequency bands allocated to the radio astronomy on a primary basis”
* Working document toward PDNR ITU-R M.[GMDSS-SATREG] “Introduction of additional mobile-satellite service systems into the GMDSS”

CEPT and/or ECC Documentation (Decisions, Recommendations, Reports)

* Decision ECC/DEC/(09)02: “The harmonisation of the bands 1610-1626.5 MHz and 2483.5-2500 MHz for use by systems in the Mobile-Satellite Service” approved 26 June 2009, amended 02 November 2012
* ECC Report 171: “Impact of unwanted emissions of IRIDIUM satellites on radio astronomy operations in the band 1610.6-1613.8 MHz” Tallinn, October 2011
* ECC Report 226: “Unwanted emissions of IRIDIUM satellites in the band 1610.6-1613.8 MHz, monitoring campaign 2013” approved 30 January 2015

EU Documentation (Directives, Decisions, Recommendations, other), if applicable

# Actions to be taken

# Relevant information from outside CEPT (examples of these are below)

## European Union (date of proposal)

## Regional telecommunication organisations

APT (MarCH 2018)

Preliminary View(s):

APT Members support the ITU-R studies on possible regulatory actions for GMDSS modernization to enhance maritime capabilities and the studies on sharing and compatibility with other services in the frequency bands and adjacent frequency bands under study and to ensure possible modification to the Radio Regulations to protect services to which the frequency bands are currently allocated without any constraints by additional GMDSS satellite systems, in accordance with the Resolution 359 (Rev. WRC-15).

regarding Resolves 1,

* APT Members support the incorporation of NAVDAT systems and NAVDAT frequencies, both MF and HF as described in Recommendation ITU-R M.2010 and ITU-R M.2058 into consideration for addressing this Agenda item.
* The recognition of these MF NAVDAT and HF NAVDAT frequencies as GMDSS for inclusion into RR Appendix 15 would be considered at a future WRC after IMO concludes its work on the modernization of the GMDSS.
* The existing frequencies used for NAVTEX should be retained and protected.

regarding Resolves 2,

* APT Members support possible modifications to the provisions of the RR to provide for additional satellite systems into the GMDSS, taking into consideration the activities of IMO, while ensuring no additional impact on the existing services, particularly RAS, within the frequency band and the adjacent bands under study.

Other View(s) from APT Members:

* Some APT members are of the view that any modernization of GMDSS should not limit the use of the bands 415-495 kHz and 505-526.5 kHz for radiotelegraphy service considering the frequency bands 415-495 kHz and 505-526.5 kHz are used by existing radiotelegraphy services.
* Some APT Members recognize that the MSS allocations under study (1610-1626.5 MHz) include a primary allocation in the Earth-to-space direction (uplink) and a secondary allocation in the space-to-Earth direction (downlink), and consequently a solution in which GMDSS is provided in an uplink and downlink in the same frequency band may provide sufficient protection to the downlink without requiring changes to the allocation status of the frequencies considered.
* One APT Member proposed a method to maintain the current allocation but identify only the uplink for use by GMDSS.
* Some APT Members support to consider the frequency(ies) to be used for national MF NAVDAT.

ATU (August 2018)

On Issue A: modernisation of GMDSS Method A2, which entails modifications to the provisions of RR to include regulatory provisions for the frequencies to be used for medium frequency (MF) and high frequency (HF) Navigational Data (NAVDAT) systems, in support of GMDSS modernization following related activity in the IMO, to satisfy Issue A.

On Issue B: introduction of additional GMDSS satellite system Method B1, which entails introduction of additional satellite operator in the GMDSS, as approved by International Maritime Organization (IMO), in order to achieve, redundancy and global coverage in maritime safety services.

ASMG (April 2018)

ASMG is to support:

* reviewing the possible regulatory actions for modernization of GMDSS
* adding new satellite systems to GMDSS with insuring compatibility with the current system without adding new constraints on the services on the proposed and the adjacent bands.
* NOC to the frequency allocation table.
* Following-up the on-going studies in ITU-R.

CITEL (June 2018)

Preliminary views and proposals from a few countries:

* proposals to amend Article 5, Table 15-2 of Appendix 15, No. 33.50 and No. 33.53 of Article 33 to enable the introduction of an additional GMDSS satellite system in the band 1616-1626.5 MHz

RCC (October, 2018)

The RCC Administrations consider that the IMO position should be taken into account in regard to the GMDSS modernization, including the introduction of the IMO-recognized additional satellite systems, when developing relevant regulatory actions to support such modernization considering protection of existing services and systems.

On issue A (GMDSS modernization)

The RCC Administrations support designating the frequency band 495-505 kHz for digital broadcasting of maritime safety and security related information (NAVDAT LF system).

The RCC Administrations support designating the frequency bands: 4 221–4 231 kHz, 6 332.5–6 342.5 kHz, 8 438–8 448 kHz, 12 658.5–12 668.5 kHz, 16 904.5–16 914.5 kHz, 22 445.5–22 455.5 kHz to digital broadcasting of maritime safety and security related information (NAVDAT HF system) provided that the existing conditions for their allocation to radio services are maintained.

On issue B (Introduction of additional satellite systems in GMDSS):

The RCC Administrations support introducing additional non-geostationary MSS satellite networks in GMDSS, subject to their approval by IMO.

## International organisations

IATA (date of proposal)

ICAO (September 16)

To ensure that any change to the regulatory provisions and spectrum allocations resulting from this agenda item do not adversely impact on the capability of search and rescue aircraft to effectively communicate with vessels during disaster relief operations.

To ensure that any regulatory provisions in response to this agenda item do not adversely impact SARPS compliance of aeronautical mobile-satellite (route) service satellite systems.

IMO (September 17)

IMO invites ITU to:

1. conduct frequency studies, consider revisions to existing instruments and take regulatory actions, as appropriate, to facilitate the implementation of GMDSS modernization;
2. take appropriate regulatory measures to ensure full protection and availability of the frequency bands to be used by new recognized GMDSS satellite service providers for the provision of GMDSS services; and
3. resolve any issues under Resolution 359 (Rev.WRC-15), in relation to the future operation of newly recognized GMDSS satellite service providers.

SFCG (date of proposal)

WMO and EUMETNET (date of proposal)

NATO (January 2018)

This NATO military assessment summary is a common military assessment of the NATO Nations on the potential impacts and benefits of Agenda Item 1.8. It does not constitute a common position of the NATO Nations.

Maritime safety enhancements are critical to military operations. Modernization measures and other enhancements should be able to co-exist with existing standard equipment installed on ships. Sharing and compatibility studies should take into account the unique interference environment on-board vessels and within certain frequency ranges. In addition, compatibility studies need to account for the impact of regulatory changes on incumbent military systems (tactical radio relay) operating in the fixed service to accommodate a potential new GMDSS Service provider in the band 1618.725-1626.5 MHz.

## Regional organisations

ESA (date of proposal)

Eurocontrol (date of proposal)

## OTHER INTERNATIONAL AND REGIONAL ORGANISATIONS

EBU (date of proposal)

GSMA (date of proposal)

CRAF (27 June 2017)

As stated in Resolution. 359, the new GMDSS provider must provide protection of incumbent services in accordance with the Radio Regulations, including those in adjacent frequency bands, from harmful interference. CRAF supports the protection of the existing primary RAS allocation in the 1 610.6-1 613.8 MHz band. No action on the modernization of the GMDSS and changes to the RR should be made unless the RAS band is free from harmful interference and acceptable sharing and compatibility criteria are developed with the RAS.