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| **42 MEETING OF PERMANENT****CONSULTATIVE COMMITTEE II:****RADIOCOMMUNICATIONS****August 28 to September 01, 2023****Ottawa, Canada** | **OEA/Ser.L/XVII.4.2.42****CCP.II-RADIO /doc. 5892/23****06 August 2023****Original: English** |
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|  | **PROPOSED MODIFICATIONS TO PRELIMINARY PROPOSAL FOR WRC-23 AGENDA ITEM 1.7** |  |
|  | **(Item on the Agenda: 3.1 (SGT-2))** |  |
|  | **(Document submitted by the delegation of the United States of America)** |  |

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| **Impact on the sector:** |
| This document supports the work of CITEL’s PCC.II Working Group for WRC under 3.1 of the agenda. |

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| **Executive Summary:** |
| This document proposes modifications to US footnotes **5.A17** and **5.B17** from the output of the 41 CITEL PCC.II meeting. The modifications to footnote **5.A17** are editorial. The modifications to footnote **5.B17** includes the specific location where the coordination threshold is applied.Proposed Modifications to the Preliminary Proposal are shown in Cyan highlight. |

**Proposed Modifications to the Preliminary Proposal are shown in Cyan highlight**

**Agenda Item 1.7:** *to consider a new aeronautical mobile-satellite (R) service (AMS(R)S) allocation in accordance with Resolution* ***428 (WRC-19)*** *for both the Earth-to-space and space-to-Earth directions of aeronautical VHF communications in all or part of the frequency band 117.975-137 MHz, while preventing any undue constraints on existing VHF systems operating in the AM(R)S, the ARNS, and in adjacent frequency bands;*

**BACKGROUND**

**Source: CAN 5627**

Support:

**Brazil, Canada**

Space-based VHF communication is a concept in which aircraft operating in remote regions and oceanic areas provide communications from the aircraft to air traffic control (ATC) via satellite, as direct ATC communication with aircraft operating in these areas is not possible. Although there are other limited communications available that are ranging from HF communications to controller to pilot data link communications (CPDLC), they do not meet the required communication performance for reduced separation minima, without modification to aircraft equipment. Therefore, an appropriate communication means is required over oceanic and remote areas, where there is currently no suitable solution to provide aeronautical VHF services.

The frequency band 117.975- 137 MHz is allocated on a primary basis to the AM(R)S service and used for air-ground, ground-air and air-air systems, providing critical voice and data communications for air traffic management and airline operational control on a global basis.

The adjacent frequency band 108-117.975 MHz is allocated on a primary basis to the aeronautical radionavigation service (ARNS), and to the AM(R)S in accordance with Resolution **413 (Rev.WRC-12)**. In addition, the frequency bands 132-136 MHz and 136-137 MHz are also allocated in several countries to the aeronautical mobile (OR) service (AM(OR)S) on a primary basis under RR Nos. **5.201** and **5.202**). Furthermore, RR No. **5.200** defines the frequency 121.5 MHz as the aeronautical emergency frequency and, where required, the frequency 123.1 MHz is the aeronautical frequency auxiliary to 121.5 MHz.

**Source: USA 5590**

Support:

**USA**

The frequency band 117.975 - 137 MHz is allocated on a primary basis to the AM(R)S service and used for air-ground, ground-air and air-air systems, providing critical voice and data terrestrial communications for air traffic management and airline operational control on a global basis. Resolution **428 (WRC-19)** invites WRC-23 to consider a new primary allocation to the AMS(R)S based on the results of sharing and compatibility studies. This new AMS(R)S service is intended to support direct pilot-air traffic controller voice as well as data communications in oceanic and remote areas without modifying aircraft equipment.

**Source: USA 5590**

Support:

**USA**

The AM(R)S allocation in 117.975-137 MHz supports Air Traffic Control (ATC) and Aeronautical Operational Control (AOC) systems for aircraft. This includes both standard voice communications and datalink systems utilizing data messages for ATC and AOC functions to aircraft in the air and on the ground. There is significant utilization by terrestrial VHF systems within this allocation today, thus severely limiting options for new regional or national satellite frequency assignments that would need to be harmonized with existing terrestrial assignments.

Many administrations use ICAO regional groups to plan and register cross border assignments in the 117.975-137 MHz frequency band. However, not all administrations participate in this process, and even those that do may only include ATC voice but not either AOC or applicable AM(OR)S assignments. For example, several administrations within ITU-R Region 2 coordinate cross border AM(R)S assignments directly through mutual bilateral agreements but do not participate in any ICAO process for recording any AM(R)S assignments.

**Source: USA 5590**

Support

**USA**

The current draft ITU-R studies carried out under Resolution **428 (WRC-19)** indicate support for a new primary AMS(R)S service in the 117.975 – 136 MHz frequency band provided such an allocation is found to be compatible with existing services and implemented with an appropriate means of planning and coordination. The new allocation must protect existing primary services in and adjacent to the frequency band 117.975-137 MHz and should not constrain the planned usage of those systems.

**Source: CAN 5627**

Support

**Brazil, Canada**

This new AMS(R)S allocation is intended to support direct pilot to air traffic controller voice as well as data communications in oceanic and remote areas without modifying aircraft equipment thus avoiding a prohibitively expensive aircraft retrofit program by utilizing existing on-board VHF radios used for AM(R)S related communications.

**DISCUSSION**

**Source: B 5748r1 and CAN 5627**

Support

**Brazil, Canada**

Regarding in-band compatibility between AM(R)S and AMS(R)S, ICAO indicated that any potential interference between ground and satellite facilities would be addressed by conventional frequency planning exercises, by assigning frequencies to the satellite system over specific regions of interest. Therefore, from an ICAO perspective a comprehensive compatibility study between systems operating under these two different services, supported by the same equipment on-board the aircraft, would not be needed. Until the frequency planning is completed by ICAO, Article **9.11A** coordination procedure could potentially be applied to AMS(R)S and also for coordination between AM(R)S and AMS(R)S.

Similarly, in-band compatibility between AMS(R)S and AM(OR)S could be addressed by frequency planning since AM(OR)S operates within the national assignments of AM(R)S.

Adjacent band compatibility studies in ITU-R conducted thus far indicated that unwanted emissions above 137 MHz from AMS(R)S space stations operating in the sub-band 117.975-136 MHz, would meet spurious emission limits in RR Appendix **3**.For transmitting AMS(R)S space stations operating in the sub-band 136-137 MHz, a pfd limit of [-166.6 dB(W/(m².14 kHz)] could be sufficient to ensure compatibility with Mobile-Satellite Services (MSS) (space-to-Earth), Space Operations Services (SOS) (space-to-Earth), Space Research Services (SRS) (space-to-Earth), and Meteorological Satellites (MetSat) (space-to-Earth) operating above 137 MHz. These technical conditions are subject to further confirmation upon finalization of the ITU-R studies.

Studies are ongoing on the protection of receiving space stations in AMS(R)S operating in the band 117.975-137 MHz from potential interference caused by space stations operating above 137 MHz.

**PROPOSAL**

**ARTICLE 5**

**Frequency allocations**

**Section IV – Table of Frequency Allocations**(See No. **2.1**)

**MOD PP/AI 1.7/1**

Source:*[Editor’s Note: In order to avoid having 3 versions of the 75.2-137.175 MHz table, the following table was developed to reflect the consolidation of the proposals by the contributing administrations. Discussion and identification of specific SUPPORT for the new or modified Footnotes follows the table.]*

75.2-137.175 MHz

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| Allocation to services |
| Region 1 | Region 2 | Region 3 |
| 117.975-13**7** AERONAUTICAL MOBILE (R) AERONAUTICAL MOBILE-SATELLITE (R)  ADD 5.A17 ADD 5.B17 ADD 5.C17 ADD 5.D17  5.111 5.200 5.201 5.202 |

Source: B 5748r1 and CAN 5627

Support:

Brazil, Canada, USA

ADD DIAP/AI 1.7/2

**5.A17** The use of the frequency band 117.975-137 MHz by the aeronautical mobile-satellite (R) service, shall be limited to non-geostationary–satellite systems and internationally standardized aeronautical systems, and subject to coordination under No. **9.11A**[ (excluding No. 9.16)].

**Reasons:** To ensure coexistence amongst AMS(R)S systems, as well as, between AMS(R)S systems with respect to AM(R)S and AM(OR)S in the frequency band 117.975-137 MHz.The new AMS(R)S allocation is to be used only by non-geostationary-satellite systems and internationally standardized aeronautical systems.

**Option 1:**

**Source:** B 5748r1 and CAN 5627

Support:

Brazil, Canada

**ADD DIAP/1.7/2**

**5.B17** Unless otherwise agreed between the administrations concerned, operation of an administration’s non-GSO aeronautical mobile-satellite (Route) service system in the frequency band 117.975-137 MHz (space-to-Earth) shall not produce by the space station pfd exceeding [-148 dB(W/(m2.4 kHz))] at the Earth’s surface over territory of any other administration. Administration responsible for a non-GSO aeronautical mobile-satellite (Route) service system shall indicate in its coordination request list of administrations that would be receiving on their territories emissions exceeding above pfd limit, but have not yet reached the necessary agreements, to make a qualified favourable finding with respect to this provision. This provisional finding regarding compliance with above pfd limit shall be changed to a definitive favourable finding at the notification stage, only if all explicit agreements from administrations for which pfd limit is exceeded are obtained and an indication thereof is provided to the Bureau within two years from the date of receipt of the coordination request. Otherwise, this provisional finding shall be changed to a definitive unfavourable finding.

**Reasons:** To ensure coexistence between new AMS(R)S and in-band incumbent AM(R)S or AM(OR)S, a PFD limit is proposed which alleviates potential challenges to validate compliance by the BR, which remained in the existing regulatory framework in the CPM report for Method B1. This PFD limit was calculated taking into account what is stated on ICAO Annex 10, Volume 3, item 2.2.2.2 and Volume 5, item 4.1.4.. This value may require further assessment to apply to the new AMS(R)S allocation.

**Option 2:**

Source: USA 5590

Support:

USA

**ADD PP/1.7/2**

**5.B17** The coordination threshold, used under No. **9.14** between an aeronautical mobile-satellite (R) service (AMS(R)S) space station and an aeronautical mobile (R) service (AM(R)S) station, shall be applied when the power flux density level from a space station operating in the AMS(R)S exceeds -150 dB(W/(m2 · 4 kHz)) on the Earth’s surface over the territory of an administration . Stations in the AMS(R)S operating in the 117.975-137 MHz frequency band shall not cause harmful interference to, nor claim protection from stations in the AM(R)S.Nos. **5.43** and **5.43A** apply.

**Reasons:** To ensure the current and future AM(R)S systems are not constrained. The proposed PFD limit was calculated taking into account what is stated in ICAO Annex 10, Volume 3, item 2.2.2.2 and Volume 5, item 4.1.4 to ensure coesxistance between new AMS(R)S and in-band incumbent AM(R)S.

**Source:** B 5748r1, CAN 5627, and USA offline updates

Support:

Brazil, Canada, USA

**ADD DIAP/1.7/3**

**5.C17** In the frequency band 117.975-137 MHz, space stations operating in the aeronautical mobile-satellite (R) service should ensure that the power flux-density of their unwanted emissions in the adjacent band 137-138 MHz does not exceed [−166.6 dB(W/(m² · 14 kHz))/ -176.8 dB(W/(m² · 4 kHz))] at the Earth’s surface.

**Reasons:** In order to ensure compatibility with incumbent adjacent primary MSS (space-to-Earth), SOS (space-to-Earth), SRS (space-to-Earth), and MetSat (space-to-Earth) operating above 137 MHz, new AMS(R)S space stations transmitting within the band 117.975-137 MHz should meet pfd limit at the Earth’s surface in the adjacent band 137-138 MHz. The exact value of the pfd limit is subject to confirmation based on the finalization of the studies in ITU-R.

**Source:** **USA 5590 and offline updates**

Support:

**[Brazil], [Canada], USA**

**ADD PP/1.7/4**

**5.D17** The receiving AMS(R)S space station in the frequency band 117.975-137 MHz shall not constrain the development and use in the Mobile-Satellite Services (MSS) (space-to-Earth), Space Operations Services (SOS) (space-to-Earth), Space Research Services (SRS) (space-to-Earth), and Meteorological Satellites (MetSat) (space-to-Earth) services operating in the adjacent frequency band above 137 MHz.   (WRC‑23)

**Reasons:** In order to not constrain use by incumbent adjacent primary MSS (space-to-Earth), SOS (space-to-Earth), SRS (space-to-Earth), and MetSat (space-to-Earth) operating above 137 MHz, new AMS(R)S space stations receivers within the 117.975-137 MHz band are subject to this restriction. New AMS(R)S satellite receivers would operate near other satellite transmitters in the MSS, SOS, SRS, and MetSat services.

**Source: USA 5590**

Support:

Brazil, Canada, USA

SUP DIAP/1.7/5

RESOLUTION 428 (WRC‑19)

**Studies on a possible new allocation to the aeronautical mobile-satellite (R) service within the frequency band 117.975-137 MHz in order to support aeronautical VHF communications in the Earth-to-space and space-to-Earth directions**

**Reasons:** This resolution may be suppressed by WRC-23 because of a decision to add a new provision in Article **5** for AMS(R)S.