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| A close up of a sign  Description automatically generated | **World Radiocommunication Conference (WRC-23) Dubai, 20 November - 15 December 2023** | |  |
|  | |  | |
|  | | **Doc. CPG(23)060 ANNEX V-07** | |
| PLENARY MEETING | | **Addendum 7 to Document 4466-E** | |
|  | | **29 August 2023** | |
|  | | **Original: English** | |
|  | | | |
| European Common Proposals | | | |
| Proposals for the work of the conference | | | |
|  | | | |
| Agenda item 1.7 | | | |

1.7 to consider a new aeronautical mobile-satellite (R) service 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 aeronautical mobile (R) service, in the aeronautical radionavigation service, and in adjacent frequency bands;

Introduction

This European Common Proposal proposes to add a new allocation to the aeronautical mobile-satellite (R) service (AMS(R)S) in the frequency band 117.975-137 MHz, limited to non-geostationary and internationally standardized aeronautical systems.

This proposal is based on a merge of Methods B1, B2 and B3 as described in the Report of the CPM to WRC-23, by including the key elements of those methods, notably allocation in the frequency band 117.975 – 137 MHz associated to footnotes and a new WRC Resolution.

The proposals take into account:

* the need to ensure in-band coexistence between aeronautical services through frequency planning and coordination;
* the need to protect AMS(R)S satellite receivers from mobile-satellite service (MSS), space operation service (SOS), space research service (SRS) and MetSat systems operating above 137 MHz, whose planned usage shall not be adversely impacted. Studies within Working Party 5B of the ITU-R have concluded on several results which are based on several assumptions examining different deployment scenarios of adjacent band services.

Coexistence between the AMS(R)S in the frequency band 117.975-137 MHz and satellite services operating in the adjacent frequency band 137-138 MHz is ensured by:

* A power flux-density (pfd) limit on AMS(R)S space stations unwanted emissions falling in the frequency band 137-138 MHz, in order to ensure protection of adjacent band services above 137 MHz.
* Applying the new Resolution **[EUR-A17-SAT-VHF] (WRC-23)** on the use of the frequency band 117.975-137 MHz by the AMS(R)S, in order to detail certain elements of the regulatory framework of the AMS(R)S, in particular to address the respective roles of ITU and ICAO.
* Specific regulatory measures in the frequency range 136.8-137 MHz, detailed in the new WRC Resolution, that ensure that new AMS(R)S space stations operating in the frequency band 117.975-137 MHz would not adversely impact satellite services operating in the adjacent frequency band 137-138 MHz, without imposing additional regulatory provisions on those services operating in the frequency band 137-138 MHz.

Coexistence between the AMS(R)S and other services operating in the frequency band 117.975-137 MHz is ensured by:

* Applying a coordination threshold of −140 dB(W/(m2 · 4 kHz)) at the Earth’s surface for AMS(R)S space stations for application of No. **9.14**, with respect to the AM(OR)S.
* Coordination for the AMS(R)S with respect to the AM(R)S and AMS(R)S according to No. **9.11A**.

In addition, Resolution **428 (WRC-19)** is proposed for suppression.

Proposals

ARTICLE 5

Frequency allocations

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

MOD EUR/XXXXA7/1

75.2-137.175 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 117.975-137 AERONAUTICAL MOBILE (R)  AERONAUTICAL MOBILE-SATELLITE (R) ADD 5.A17 ADD 5.B17  5.111 5.200 5.201 5.202 | | |

ADD EUR/XXXXA7/2

5.A17 The use of the frequency band 117.975-137 MHz by the aeronautical mobile-satellite (R) service is subject to coordination under No. **9.11A**, and is limited to internationally standardized aeronautical systems as developed by ICAO and to non-geostationary satellite systems. Resolution **[EUR A17-SAT VHF] (WRC-23)** applies.     (WRC‑23)

**Reasons:** To make the new AMS(R)S allocation subject to No. **9.11A** coordination, to ensure that the new AMS(R)S allocation is used only by internationally standardised aeronautical systems and by non-geostationary satellite systems.

ADD EUR/XXXXA7/3

5.B17 In the frequency band 136.9375-137 MHz, space stations operating in the aeronautical mobile-satellite (R) service should ensure that the maximum level of their emissions above 137 MHz does not exceed a pfd of −166.6 dB(W/(m² · 14 kHz)).     (WRC‑23)

**Reasons:** To ensure the protection of the incumbent services above 137 MHz from out of band emissions of AMS(R)S systems operating below 137 MHz.

APPENDIX 4 (REV.WRC‑19)

Consolidated list and tables of characteristics for use in the  
application of the procedures of Chapter III

ANNEX 2

Characteristics of satellite networks, earth stations  
or radio astronomy stations[[1]](#footnote-1)2    (Rev.WRC‑12)

Footnotes to Tables A, B, C and D

MOD EUR/XXXXA7/4

**TABLE A**

GENERAL CHARACTERISTICS OF THE SATELLITE NETWORK OR SYSTEM,  
EARTH STATION OR RADIO ASTRONOMY STATION     (Rev.WRC‑23)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Items in Appendix** | ***A \_ GENERAL CHARACTERISTICS OF THE SATELLITE NETWORK OR SYSTEM, EARTH STATION OR RADIO ASTRONOMY STATION*** | **Advance publication of a geostationary- satellite network** | **Advance publication of a non-geostationary-satellite network or system subject to coordination under Section II  of Article 9** | **Advance publication of a non-geostationary-satellite network or system not subject to coordination under Section II  of Article 9** | **Notification or coordination of a geostationary-satellite network (including space operation functions under Article 2A of Appendices 30 or 30A)** | **Notification or coordination of a non-geostationary-satellite network or system** | **Notification or coordination of an earth station (including notification under  Appendices 30A or 30B)** | **Notice for a satellite network in the broadcasting-satellite service under  Appendix 30 (Articles 4 and 5)** | **Notice for a satellite network  (feeder-link) under Appendix 30A  (Articles 4 and 5)** | **Notice for a satellite network in the fixed- satellite service under Appendix 30B  (Articles 6 and 8)** | **Items in Appendix** | **Radio astronomy** |
| **A.17** | **COMPLIANCE WITH POWER FLUX-DENSITY (pfd) LIMITS** |  | | | | | | | | | **A.17** |  |
| … | … | … | … | … | … | … | … | … | … | … | … | … |
| A.17.f.1 | a commitment of compliance with per-satellite power flux-density level produced at the Earth’s surface of −166.6 dB(W/(m2 · 14 kHz)) in any 14 kHz band in the band 137-138 MHz under free space propagation conditions  Required only for satellite systems operating in the aeronautical mobile-satellite (R) service in the frequency band 136.9375-137 MHz |  |  |  |  | **+** |  |  |  |  | A.17.f.1 |  |
| … | … | … | … | … | … | … | … | … | … | … | … | … |

**Reasons:** To ensure compliance with the pfd limit of unwanted emissions in the frequency band 137-138 MHz resulting from AMS(R)S in the frequency band 136.9375-137 MHz.

APPENDIX 5 (REV.WRC‑19)

Identification of administrations with which coordination is to be effected or  
agreement sought under the provisions of Article 9

ANNEX 1     (Rev.WRC‑19)

# 1 Coordination thresholds for sharing between MSS (space-to-Earth) and terrestrial services in the same frequency bands and between non‑GSO MSS feeder links (space-to-Earth) and terrestrial services in the same frequency bands and between RDSS (space-to-Earth) and terrestrial services in the same frequency bands     (WRC‑12)

MOD EUR/XXXXA7/5

## 1.1 Below 1 GHz[[2]](#footnote-2)\*

1.1.1 In the bands 137-138 MHz and 400.15-401 MHz, coordination of a space station of the MSS (space-to-Earth) with respect to terrestrial services (except aeronautical mobile (OR) service networks operated by the administrations listed in Nos. **5.204** and **5.206** as of 1 November 1996) is required only if the pfd produced by this space station exceeds −125 dB(W/(m2 · 4 kHz)) at the Earth’s surface.

1.1.2 In the band 137-138 MHz, coordination of a space station of the MSS (space-to-Earth) with respect to the aeronautical mobile (OR) service is required only if the pfd produced by this space station at the Earth’s surface exceeds:

– −125 dB(W/(m2 · 4 kHz)) for networks for which complete Appendix **3**[[3]](#footnote-3)\*\* coordination information has been received by the Bureau prior to 1 November 1996;

– −140 dB(W/(m2 · 4 kHz)) for networks for which complete Appendix **4/S4/3**\*\* coordination information has been received by the Bureau after 1 November 1996 for the administrations referred to in § 1.1.1 above.

1.1.3 In the band 137-138 MHz, coordination is also required for a space station on a replacement satellite of a MSS network for which complete Appendix **3**\*\* coordination information has been received by the Bureau prior to 1 November 1996 and the pfd exceeds −125 dB(W/(m2 · 4 kHz)) at the Earth’s surface for the administrations referred to in § 1.1.1 above.

1.1.4 In the frequency band 132- 137 MHz, coordination of a space station of the aeronautical mobile-satellite (R) service (space-to-Earth) with respect to the aeronautical mobile (OR) service is required only if the pfd produced by this space station exceeds −140 dB(W/(m2 · 4 kHz)) on the territory of countries listed in No. **5.201** or No. **5.202**, respectively.

**Reasons:** In countries with an AM(OR)S allocation under No. **5.201** or No. **5.202**, to apply the same pfd coordination threshold of -140 dB(W/(m2 · 4 kHz)) as currently in force in the adjacent frequency band 137-138 MHz between mobile-satellite service (space-to-Earth) and AM(OR)S allocated in some countries under No. **5.206**.

ADD EUR/XXXXA7/6

Draft New Resolution [EUR-A17-SAT-VHF] (WRC-23)

Use of the frequency band 117.975-137 MHz by  
the aeronautical mobile-satellite (R) service

The World Radiocommunication Conference (Dubai, 2023),

considering

*a)* that the optimization of air traffic management (ATM) over oceanic and remote areas necessitates appropriate aeronautical surveillance and communication means, in order to meet the required communication performance for reduced separation minima;

*b)* that WRC-23 allocated the frequency band 117.975-137 MHz to the aeronautical mobile-satellite (R) service (AMS(R)S), limited to non-geostationary satellite systems that operate in accordance with recognized international aeronautical standards, and subject to No. **9.11A** coordination provisions;

*c)* that the allocation of the frequency band 117.975-137 MHz to the AMS(R)S) is intended for the relay via satellite of VHF communications under the aeronautical mobile (R) service (AM(R)S), in order to complement terrestrial communication infrastructures when aircraft are operating in oceanic and remote areas;

*d)* that the VHF channels have become congested in some areas and the new AMS(R)S systems need to operate in such a manner as not to constrain existing systems, without modification to aircraft equipment,

noting

*a)* that there are Standards and Recommended Practices (SARPs) developed by the International Civil Aviation Organization (ICAO) detailing frequency assignment planning criteria for VHF air-ground communication systems;

*b)* that in accordance with ICAO SARPs the emergency channel (121.5 MHz) shall be used only for genuine emergency purposes, and where a requirement is established for the use of a frequency auxiliary to 121.5 MHz, the frequency 123.1 MHz shall be used;

*c)* that the frequency planning between stations operated under AM(R)S and AM(OR)S in the frequency band 117.975-137 MHz is performed by competent organizations under ICAO purview;

*d)* that the development of compatibility criteria between new AMS(R)S systems proposed for operations under *considering c)* and ICAO-standardized aeronautical systems in the frequency band 117.975-137 MHz is the responsibility of ICAO;

*e)* that ICAO frequency planning exercises between aeronautical systems in the frequency band 117.975-137 MHz will take into account the operational areas of AM(R)S/AM(OR)S aircraft stations and of AMS(R)S aircraft earth stations including where recording of frequency assignments in the MIFR is not possible;

*f)* that feeder links of AMS(R)S systems may be accommodated in the fixed-satellite service;

*g)* that ITU-R studies have been conducted to assess the interference environment of AMS(R)S space receivers from unwanted emissions (out of band and in some cases, spurious) generated by space stations of services operating in the adjacent frequency band 137-138 MHz,

recognizing

*a)* that the frequency band 117.975-137 MHz is allocated on a primary basis to the AM(R)S and is used by air-ground, air-air and ground-air systems operated in accordance with ICAO SARPs, providing critical voice and data communications for ATM on a global basis;

*b)* that under No. **5.200**, the frequency 121.5 MHz is the aeronautical emergency frequency and, where required, the frequency 123.1 MHz is the aeronautical frequency auxiliary to 121.5 MHz;

*c)* that under Nos. **5.201** and **5.202**, the frequency bands 132‑136 MHz and 136-137 MHz are also allocated in several countries to the aeronautical mobile (OR) service on a primary basis;

*d)* that coordination under No. **9.11A** applies for assignments of administrations wishing to operate AMS(R)S space stations or AMS(R)S aircraft earth stations in the frequency band 117.975-137 MHz;

*e)* that AMS(R)S space stations are subject to coordination under No. **9.14** with respect to AM(R)S stations in overlapping frequencies when in line of sight;

*f)* that AMS(R)S space stations are subject to coordination under No. **9.14** with respect to AM(OR)S stations in overlapping frequencies when the pfd threshold in Annex 1 to Appendix **5** is exceeded;

*g)* that AMS(R)S aircraft earth stations are subject to coordination under No. **9.15** with respect to ground based or aircraft AM(R)S/AM(OR)S stations located in the respective coordination areas, using the predetermined coordination distances indicated in Table 10 of Appendix **7**, for which overlapping assignments are recorded in the MIFR,

*h)* that Annex 10 to the Convention on International Civil Aviation contains SARPs for safety aeronautical radionavigation and radiocommunication systems used by international civil aviation,

resolves

1 that until SARPs are developed within ICAO, administrations shall operate AMS(R)S stations only for experimentation purposes in cooperation with ICAO;

2 that the frequencies 121.5 MHz and 123.1 MHz can only be used for emergency and distress purposes as described in Articles **31** and **44**;

3 that in order to protect the auxiliary frequency 123.1 MHz, the nearest assignable frequencies on either side of 123.1 MHz shall be 123.05 MHz and 123.15 MHz;

4 that in order to protect the emergency frequency 121.5 MHz, the nearest assignable frequencies on either side of 121.5 MHz shall be 121.45 MHz and 121.55 MHz;

5 that the identification of channels, following ICAO procedures, for possible use by AMS(R)S shalltake into account the current deployment of stations operating in the AM(R)S and not adversely affect their potential modifications while taking also into account *noting* *c)* when seeking agreement for the coordination procedures under No. **9.11A**;

6 that when operating in the frequency band 136.8-137 MHz, AMS(R)S space receivers shall be able to operate in the presence of out-of-band aggregated power level as described in the Annex to this Resolution, as a result of satellite systems operating in the frequency band 137-138 MHz,

instructs the Secretary-General

to bring this Resolution to the attention of ICAO and IMO.

ANNEX to Draft New Resolution [EUR-A17-SAT-VHF] (WRC-23)

The following table provides the power levels for several percentages of time for the channel at 136.975 MHz:

|  |  |
| --- | --- |
| % of the time | Out-of-band aggregated power level (dBW/25 kHz) in the channel centred at 136.975 MHz |
| 50 | -180 |
| 10 | -157 |
| 1 | -148 |
| 0.1 | -140 |
| 0.01 | -134 |
| 0.001 | -128 |
| 0.0001 | -125 |

The rate of roll-off is -21 dB/(100 kHz) between 136.975 MHz and 136.875 MHz, and -8 dB/(100 kHz) between 136.875 MHz and 136.8 MHz.

SUP EUR/XXXXA7/7

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

1. 2 The Radiocommunication Bureau shall develop and keep up-to-date forms of notice to meet fully the statutory provisions of this Appendix and related decisions of future conferences. Additional information on the items listed in this Annex together with an explanation of the symbols is to be found in the Preface to the BR IFIC (Space Services).    (WRC‑12) [↑](#footnote-ref-1)
2. \* These provisions apply only to the MSS. [↑](#footnote-ref-2)
3. \*\* *Note by the Secretariat*: Edition of 1990, revised in 1994. [↑](#footnote-ref-3)