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| --- | --- | --- |
| A close up of a sign  Description automatically generated | **World Radiocommunication Conference (WRC-23)Dubai, 20 November - 15 December 2023** |  |
|  |  |
|  |  |
| PLENARY MEETING | **Addendum 13 toDocument 85-E** |
|  | **22 October 2023** |
|  | **Original: Russian** |
|  |
| Regional Commonwealth in the field of Communications Common Proposals |
| proposals for the work of the conference |
|  |
| Agenda item 1.13 |

1.13 to consider a possible upgrade of the allocation of the frequency band 14.8-15.35 GHz to the space research service, in accordance with Resolution **661 (WRC‑19)**;

Introduction

The RCC Administrations are in favour of upgrading the allocation of the frequency band 14.8-15.35 GHz to the space research service (SRS), while ensuring protection from interference of the fixed service (FS) and mobile service (MS) in the frequency band under consideration and the radio astronomy service in the frequency band 15.35‐15.4 GHz; however, the upgrade of the SRS allocation shall not impose restrictions on existing FS and MS systems in the frequency band 14.8-15.35 GHz, which are eligible for international recognition in accordance with RR Article **8**.

The RCC Administrations are in favour of Method C in the CPM Report, which includes a modification to the RR Article **5** Table of Frequency Allocations in the frequency band 14.8-15.35 GHz to upgrade the secondary SRS allocation, except SRS (active) and SRS (passive) applications, to primary, and also a modification to Table **21-4** under RR Article **21** to add pfd limits for SRS (space-to-Earth) and (space-to-space) in the frequency band 14.8-15.35 GHz. Table A of Annex 2 to RR Appendix **4** is modified to add a commitment to follow regulatory provisions to protect the radio astronomy service (RAS). Tables 7b and 8c of Annex 7 to RR Appendix **7** are modified to add parameters for determination of coordination distances around SRS earth stations. To upgrade the status of the existing assignments to SRS in the frequency band 14.8-15.35 GHz recorded in the Master International Frequency Register (MIFR) with no change in the original date of receipt, two options are proposed: a draft new WRC resolution or a footnote in the RR Article **5**. Resolution **661 (WRC-19)** is suppressed.

Proposals

The RCC Administrations are in favour of Method C in the CPM Report with amendments to the regulatory text, as presented in annex hereto.

ARTICLE 5

Frequency allocations

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

MOD RCC/85A13/1#1823

14.5-15.4 GHz

|  |
| --- |
| Allocation to services |
| Region 1 | Region 2 | Region 3 |
| ... |
| 14.8-15.35 FIXED MOBILE SPACE RESEARCH ADD 5.B113 ADD 5.C113 5.339 |
| ... |

ADD RCC/85A13/2

5.B113 **Alternative 1:** The allocation of the frequency band 14.8-15.35 GHz to the space research service on a primary basis is limited to satellite systems operating in the space-to-space, space-to-Earth and Earth-to-space directions. Other uses of the frequency band 14.8-15.35 GHz by the space research service are on a secondary basis. The use of the frequency band 14.8-15.35 GHz by the space research service satellite networks or systems with frequency assignments recorded and brought into use prior to 15 December 2023 is subject to the provisions of Resolution **[A113] (WRC‑23)**.     (WRC‑23)

 **Alternative 2:** The allocation of the frequency band 14.8-15.35 GHz to the space research service on a primary basis is limited to satellite systems operating in the space-to-space, space-to-Earth and Earth-to-space directions. Other uses of the frequency band 14.8-15.35 GHz by the space research service are on a secondary basis. In reviewing findings under No. **11.50** of the frequency assignments of space research service satellite networks or systems in the frequency band 14.8-15.35 GHz recorded in the MIFR and brought into use prior to 15 December 2023, the status of the assignments shall be upgraded without submission of a new filing by the notifying administration, with the original date of receipt of the recorded assignment retained.     (WRC‑23)

ADD RCC/85A13/3

5.C113 Stations of the space research service operating in the frequency band 14.8-15.35 GHz in the space-to-Earth and space-to-space directions shall not cause harmful interference to stations of RAS using the frequency band 15.35-15.40 GHz. The equivalent power flux-density produced in the frequency band 15.35-15.40 GHz by all space stations of a non-GSO satellite system in the space research service (space-to-Earth, space-to-space) operating in the frequency band 14.8-15.35 GHz shall be in compliance with the protection criteria provided in Recommendations ITU‑R RA.769‑2 and ITU‑R RA.1513‑2. The power flux-density produced in the frequency band 15.35-15.40 GHz by a space station of a GSO satellite network in the space research service (space-to-Earth, space-to-space) operating in the frequency band 14.8-15.35 GHz shall be in compliance with the protection criteria provided in Recommendations ITU‑R RA.769‑2 and ITU‑R RA.1513‑2.     (WRC‑23)

ADD RCC/85A13/4#1826

draft new RESOLUTION [A113] (WRC-23)

Upgrade to primary status of the secondary allocation to the space research service in the frequency band 14.8-15.35 GHz

…

instructs the Director of the Radiocommunication Bureau

in reviewing the findings under No. **11.50** of the frequency assignments of space research service satellite networks or systems in the frequency band 14.8-15.35 GHz, recorded in the MIFR prior to 15 December 2023, the status of the assignments should be upgraded without submission of a new filing by the notifying administration, the original date of receipt of the recorded assignment should be kept, subject to conformity with the new conditions of the allocation of the frequency band 14.8-15.35 GHz to the space research service examined by the Bureau. The Bureau shall ask the notifying administration whether the characteristics of the assignment will comply with the new conditions for the compatibility with the radio astronomy service in the frequency band 15.35-15.4 GHz. If the notifying administration does not respond to the Bureau’s inquiry or if the conditions of allocation of the frequency band 14.8-15.35 GHz to the space research service are not met, the Bureau shall propose the deletion of the assignment from the MIFR to the notifying administration. If the administration requests to retain the assignment with its characteristics unchanged and states that it will be operated in accordance with No. **4.4**, the assignment shall be kept in the MIFR for information purposes under the conditions of No. **8.5**.

ARTICLE 21

Terrestrial and space services sharing frequency bands above 1 GHz

Section V − Limits of power flux-density from space stations

MOD RCC/85A13/5#1827

TABLE **21-4**  (*continued*)     (Rev.WRC‑23)

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency band | Service\* | Limit in dB(W/m2) for anglesof arrival (δ) above the horizontal plane | Reference bandwidth |
| 0°-5° | 5°-25° | 25°-90° |
| … | … | … | … | … | … |
| 14.8-15.35 GHz | Space research(space-to-space) | **[0°-5°** | **[5°-25°** | **[25°-90°** | [1 MHz] |
| −124] | −124 **+**0.5(δ − 5)] | −114] |
| Space research(space-to-Earth)(geostationary-satellite orbit) | **[0°-5°** | **[5°-25°** | **[25°-90°** | [1 MHz] |
| −126] | −126 **+** 0.5(δ − 5)] | −116] |
| Space research(space-to-Earth)(non-geostationary-satellite orbit) | **[0°-5°** | **[5°-25°** | **[25°-90°** | [1 MHz] |
| −124] | −124 **+** 0.5(δ − 5)] | −114] |
| … | … | … | … | … | … | … |

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

\* The references to services are those services which have allocations in Article **5**.

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 RCC/85A13/6#1828

**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 | commitment to follow the equivalent power flux-density (epfd) produced at the site of a radio astronomy station in the frequency band 15.35-15.4 GHz, as defined in No. **5.B113** Required only for non-geostationary-satellite systems operating in the space research service (space-to-Earth, space-to-space) in the frequency band 14.8-15.35 GHz |  |  |  |  | **+** |  |  |  |  | A.17.f.1 |  |
| A.17.f.2 | commitment to follow the power flux-density (pfd) produced at the site of a radio astronomy station in the frequency band 15.35-15.4 GHz, as defined in No. **5.B113** Required only for geostationary-satellite systems operating in the space research service (space-to-Earth, space-to-space) in the frequency band 14.8-15.35 GHz |  |  |  | **+** |  |  |  |  |  | A.17.f.2 |  |
| ... | ... | **...** | **...** | **...** | **...** | **...** | **...** | **...** | **...** | **...** | ... | **...** |

APPENDIX 7 (REV.WRC‑19)

Methods for the determination of the coordination area around an earth
station in frequency bands between 100 MHz and 105 GHz

ANNEX 7

System parameters and predetermined coordination distances for determination of the coordination area around an earth station

# 3 Horizon antenna gain for a receiving earth station with respect to a transmitting earth station

MOD RCC/85A13/7

TABLE 7b    (Rev.WRC‑23)

Parameters required for the determination of coordination distance for a transmitting earth station

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Transmitting space radiocommunication service designation | Fixed-satellite,mobile-satellite | Aero-nautical mobile-satellite (R) service | Aero-nautical mobile-satellite (R) service | Fixed-satellite | Fixed-satellite | Fixed-satellite | Fixed-satellite | Earthexploration-satellite, space operation,space research | Fixed-satellite,mobile-satellite,meteorological- satellite | Fixed-satellite | Fixed-satellite | Fixed-satellite | Space research | Fixed-satellite 3 | Fixed-satellite | Fixed-satellite 3 |
| Frequency bands (GHz) | 2.655-2.690 | 5.030-5.091 | 5.030-5.091 | 5.091-5.150 | 5.091-5.150 | 5.725-5.850 | 5.725-7.075 | 7.100-7.250 5 | 7.900-8.400 | 10.7-11.7 | 12.5-14.8 | 13.75-14.3 | 14.8-15.35 | 15.43-15.65 | 17.7-18.4 | 19.3-19.7 |
| Receiving terrestrialservice designations | Fixed,mobile | Aeronautical radio-navigation | Aeronautical mobile (R) | Aeronautical radio-navigation | Aeronautical mobile (R) | Radiolocation | Fixed, mobile | Fixed, mobile | Fixed, mobile | Fixed, mobile | Fixed, mobile | Radiolocation radionavigation (land only) | Fixed, mobile | Aeronautical radionavigation | Fixed, mobile | Fixed, mobile |
| Method to be used | § 2.1 | § 2.1, § 2.2 | § 2.1, § 2.2 |  |  | § 2.1 | § 2.1 | § 2.1, § 2.2 | § 2.1 | § 2.1 | § 2.1, § 2.2 | § 2.1 | § 2.1, § 2.2 |  | § 2.1, § 2.2 | § 2.2 |
| Modulation at terrestrial station 1 | A |  |  |  |  |  | A | N | A | N | A | N | A | N | A | N | − | A | N |  | N | N |
| Terrestrial station interference parameters and criteria | *p*0 (%) | 0.01 |  |  |  |  |  | 0.01 | 0.005 | 0.01 | 0.005 | 0.01 | 0.005 | 0.01 | 0.005 | 0.01 | 0.005 | 0.01 | 0,01 | 0,005 |  | 0.005 | 0.005 |
| *n* | 2 |  |  |  |  |  | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 |  | 2 | 2 |
| *p* (%) | 0.005 |  |  |  |  |  | 0.005 | 0.0025 | 0.005 | 0.0025 | 0.005 | 0.0025 | 0.005 | 0.0025 | 0.005 | 0.0025 | 0.01 | 0,005 | 0,0025 |  | 0.0025 | 0.0025 |
| *NL* (dB) | 0 |  |  |  |  |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 | 0 |
| *Ms* (dB) | 26 2 |  |  |  |  |  | 33 | 37 | 33 | 37 | 33 | 37 | 33 | 40 | 33 | 40 | 1 | 33 | 40 |  | 25 | 25 |
| *W* (dB) | 0 |  |  |  |  |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 | 0 |
| Terrestrial station parameters | *Gx* (dBi) 4 | 49 2 | 6 | 10 | 6 | 6 |  | 46 | 46 | 46 | 46 | 46 | 46 | 50 | 50 | 52 | 52 | 36 | 52 | 52 |  | 48 | 48 |
| *Te* (K) | 500 2 |  |  |  |  |  | 750 | 750 | 750 | 750 | 750 | 750 | 1 500 | 1 100 | 1 500 | 1 100 | 2 636 | 1 500 | 1 100 |  | 1 100 | 1 100 |
| Reference bandwidth | *B* (Hz) | 4 × 103 | 150 × 103 | 37.5 × 103 | 150 × 103 | 106 |  | 4 × 103 | 106 | 4 × 103 | 106 | 4 × 103 | 106 | 4 × 103 | 106 | 4 × 103 | 106 | 107 | 4 × 103 | 106 |  | 106 | 106 |
| Permissible interference power | *Pr*( *p*) (dBW)in *B* | −140 | −160 | −157 | −160 | −143 |  | −131 | −103 | −131 | −103 | −131 | −103 | −128 | −98 | −128 | −98 | −131 | −128 | −98 |  | −113 | −113 |
| 1 A: analogue modulation; N: digital modulation.2 The parameters for the terrestrial station associated with transhorizon systems have been used. Line-of-sight radio-relay parameters associated with the frequency band 5 725‑7 075 MHz may also be used to determine a supplementary contour with the exception that *Gx* = 37 dBi.3 Feeder links of non-geostationary satellite systems in the mobile‑satellite service.4 Feeder losses are not included.5 Actual frequency bands are 7 190-7 250 MHz for the Earth exploration-satellite service, 7 100-7 155 MHz and 7 190-7 235 MHz for the space operation service and 7 145‑7 235 MHz for the space research service. |

MOD RCC/85A13/8

TABLE 8c    (Rev.WRC‑23)

**Parameters required for the determination of coordination distance for a receiving earth station**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Receiving spaceradiocommunicationservice designation** | **Fixed-satellite** | **Fixed-satellite,radio-determinationsatellite** | **Fixed-satellite** | **Fixed-satellite** | **Meteoro-logical-satellite**7, 8 | **Meteoro-logical-satellite**9 | **Earth exploration-satellite**7 | **Earth exploration-satellite**9 | **Spaceresearch**10 | **Fixed-satellite** | **Broadcasting-satellite** | **Space research** | **Broadcasting-satellite** | **Fixed-satellite**7 |
|  |  |  |  |  |  |  |  |  | Deep space |  |  |  |  |  |  |
| Frequency bands (GHz) | 4.500-4.800 | 5.150-5.216 | 6.700-7.075 | 7.250-7.750 | 7.450-7.550 | 7.750-7.900 | 8.025-8.400 | 8.025-8.400 | 8.400-8.450 | 8.450-8.500 | 10.7-12.7513.4-13.65 7 | 12.5-12.7512 | 14.8-15.35 | 17.7-17.8 | 17.7-18.819.3-19.7 |
| Transmitting terrestrial service designations | Fixed, mobile | Aeronautical radionavigation | Fixed, mobile | Fixed, mobile | Fixed, mobile | Fixed, mobile | Fixed, mobile | Fixed, mobile | Fixed, mobile | Fixed, mobile | Fixed, mobile | Fixed, mobile | Fixed | Fixed, mobile |
| Method to be used | § 2.1 | § 2.1 | § 2.2 | § 2.1 | § 2.1, § 2.2 | § 2.2 | § 2.1 | § 2.2 | § 2.2 | § 2.1, § 2.2 | § 1.4.5 | § 2.1, § 2.2 | § 1.4.5 | § 2.1 |
| Modulation at earth station1 | A | N |  | N | A | N | N | N | N | N | N | N | A | N | A | N | N |  | N |
| Earth stationinterferenceparametersand criteria | *p*0 (%) | 0.03 | 0.005 |  | 0.005 | 0.03 | 0.005 | 0.002 | 0.001 | 0.083 | 0.011 | 0.001 | 0.1 | 0.03 | 0.003 | 0.03 | 0.003 | 0.1 |  | 0.003 |
| *n* | 3 | 3 |  | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 2 |  | 2 |
| *p* (%) | 0.01 | 0.0017 |  | 0.0017 | 0.01 | 0.0017 | 0.001 | 0.0005 | 0.0415 | 0.0055 | 0.001 | 0.05 | 0.015 | 0.0015 | 0.03 | 0.003 | 0.05 |  | 0.0015 |
| *NL* (dB) | 1 | 1 |  | 1 | 1 | 1 | – | – | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |  | 1 |
| *Ms* (dB) | 7 | 2 |  | 2 | 7 | 2 | – | – | 2 | 4.7 | 0.5 | 1 | 7 | 4 | 7 | 4 | 1 |  | 6 |
| *W* (dB) | 4 | 0 |  | 0 | 4 | 0 | – | – | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | 0 |  | 0 |
| Terrestrial station parameters | *E* (dBW)in *B*2 | A | 923 | 923 |  | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 25 5 | 255 | 40 | 40 | 55 | 55 | 32 |  | 35 |
| N | 424 | 424 |  | 42 | 42 | 42 | 42 | 42 | 42 | 42 | −18 | −18 | 43 | 43 | 42 | 42 | −40 | 40 | 40 |
| *Pt* (dBW) in *B* | A | 403 | 403 |  | 13 | 13 | 13 | 13 | 13 | 13 | 13 | −175 | −175 | −5 | −5 | 10 | 10 | −5 |  | −10 |
| N | 0 | 0 |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | −60 | −60 | −2 | −2 | −3 | −3 | −5 | −7 | −5 |
| *Gx* (dBi) | 523, 4 | 523, 4 |  | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 45 | 45 | 45 | 45 | 35 | 47 | 45 |
| Reference band-width6 | *B* (Hz) | 106 | 106 |  | 106 | 106 | 106 | 107 | 107 | 106 | 106 | 1 | 1 | 106 | 106 | 27 × 106 | 27 × 106 | 106 |  | 106 |
| Permissible interference power | *Pr*( *p*) (dBW)in *B* |  |  |  | −151.2 |  |  | −125 | −125 | −15411 | −142 | −220 | −216 |  |  | −131 | −131 | −156 |  |  |

*Notes to Table 8c*:

1 A: analogue modulation; N: digital modulation.

2 *E* is defined as the equivalent isotropically radiated power of the interfering terrestrial station in the reference bandwidth.

3 In this band, the parameters for the terrestrial stations associated with transhorizon systems have been used. If an administration believes that transhorizon systems do not need to be considered, the line-of-sight radio-relay parameters associated with the frequency band 3.4-4.2 GHz may be used to determine the coordination area.

4 Digital systems assumed to be non-transhorizon. Therefore *Gx* = 42.0 dBi. For digital transhorizon systems, parameters for analogue transhorizon systems above have been used.

5 These values are estimated for 1 Hz bandwidth and are 30 dB below the total power assumed for emission.

6 In certain systems in the fixed-satellite service it may be desirable to choose a greater reference bandwidth *B*. However, a greater bandwidth will result in smaller coordination distances and a later decision to reduce the reference bandwidth may require recoordination of the earth station.

7 Geostationary-satellite systems.

8 Non-geostationary satellites in the meteorological-satellite service notified in accordance with No. **5.461A** may use the same coordination parameters.

9 Non-geostationary satellite systems.

10 Space research earth stations in the frequency band 8.4-8.5 GHz operate with non-geostationary satellites.

11 For large earth stations: *Pr*(*p*) = (*G* − 180) dBW

 For small earth stations: *Pr*(20%) = 2 (*G* − 26) − 140 dBW for  26 < *G* ≤ 29 dBi

 *Pr*(20%) = *G* − 163 dBW for          *G*  29 dBi

 *Pr*(*p*)% = *G* − 163 dBW for          *G* ≤ 26 dBi

12 Applies to the broadcasting-satellite service in unplanned bands in Region 3.

SUP RCC/85A13/9

RESOLUTION 661 **(**WRC‑19**)**

Examination of a possible upgrade to primary status of the secondary allocation to the space research service in the frequency band 14.8‑15.35 GHz

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

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)