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| A close up of a sign  Description automatically generated | **World Radiocommunication Conference (WRC-23)Dubai, 20 November - 15 December 2023** |  |
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| PLENARY MEETING | **Addendum 2 toDocument 85-E** |
|  | **22 October 2023** |
|  | **Original: Russian** |
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| Regional Commonwealth in the field of Communications Common Proposals |
| PROPOSALS FOR THE WORK OF THE CONFERENCE |
|  |
| Agenda item 1.2 |

1.2 to consider identification of the frequency bands 3 300-3 400 MHz, 3 600‑3 800 MHz, 6 425-7 025 MHz, 7 025-7 125 MHz and 10.0-10.5 GHz for International Mobile Telecommunications (IMT), including possible additional allocations to the mobile service on a primary basis, in accordance with Resolution **245 (WRC‑19)**;

Introduction

Frequency band 3 300-3 400 MHz in Region 1

The RCC Administrations are in favour of maintaining the protection currently afforded to the radiolocation service (RLS) in the frequency band 3 300-3 400 MHz and to the fixed service (FS) and fixed-satellite service (FSS) in the adjacent frequency band 3 400-4 200 MHz if any Region 1 countries are added to the existing footnotes Nos. **5.429A** and **5.429B** of Article **5** of the Radio Regulations (RR).

Protection of stations in the RLS and the FSS must be ensured on the basis of the results of the ITU‑R studies carried out in preparation for WRC‑15 (including Reports ITU‑R M.2481 and S.2368).

Currently the regulatory and technical provisions of footnotes RR Nos. **5.429A** and **5.429B** and Resolution **223 (Rev.WRC-19)** protect the RLS, in particular:

“...Stations in the mobile service operating in the frequency band 3 300-3 400 MHz shall not cause harmful interference to, or claim protection from, stations operating in the radiolocation service” and

“The use of the frequency band 3 300-3 400 MHz by IMT stations in the mobile service shall not cause harmful interference to, or claim protection from, systems in the radiolocation service, and administrations wishing to implement IMT shall obtain the agreement of neighbouring countries to protect operations within the radiolocation service”.

If new countries are added in footnotes RR Nos. **5.429A** and **5.429B**, including countries north of the parallel 30° North, those provisions must be maintained unchanged.

Frequency band 3 300-3 400 MHz in Region 2

The RCC Administrations are in favour of ensuring the protection of the RLS in Region 1 in the frequency band 3 300-3 400 MHz, and of the FS and FSS in Region 1 in the frequency band 3 400-4 200 MHz, when upgrading the category of the mobile, except aeronautical mobile, service in Region 2 and identifying the frequency band 3 300-3 400 MHz for IMT systems in Region 2, taking into account the results of the studies conducted by ITU-R in preparation for WRC-23.

ITU-R did not examine the question of the compatibility of stations in the aeronautical mobile service (AMS) in Region 2 in the frequency band 3 300-3 400 MHz with stations in the RLS in Regions 1 and 3. WRC-23 therefore lacks the technical basis for taking a decision on a new allocation to AMS in the frequency band 3 300-3 400 MHz. The RCC Administrations consider that WRC-23 can only examine the question of an allocation to the mobile, except aeronautical mobile, service in the frequency band 3 300-3 400 MHz.

Frequency band 3 600-3 800 MHz in Region 2

The RCC Administrations support a potential WRC-23 solution for this frequency band on the basis of the CPM Report’s Methods 3А or 3D for agenda item 1.2 and consider that, if this band is identified for IMT systems in Region 2, it will be necessary to adopt provisions in the Radio Regulations to provide protection to the FSS and FS in Region 1. Protection must be provided on the basis of the results of the studies carried out by ITU-R in preparation for WRC-07, WRC-12 and WRC-15 (including Report ITU-R F.2328, Report ITU-R M.2109, Report ITU-R S.2199, Report ITU-R S.2368 and Report ITU-R M.2111), taking into account the results of new ITU-R studies on the compatibility of IMT with FSS and FS earth stations in the frequency band 3 600-3 800 MHz.

Frequency band 10.0-10.5 GHz in Region 2

The RCC Administrations consider that if the frequency band 10.0-10.5 GHz or parts thereof are allocated to the mobile service and identified for IMT systems in Region 2, no additional regulatory and technical constraints should be imposed on stations in other radio services in Region 1 operating in accordance with the Radio Regulations in that band and in adjacent bands.

ITU-R did not examine the question of the compatibility of stations in the AMS in Region 2 in the frequency band 10.0-10.5 GHz with stations in the RLS and FS, and with the Earth exploration-satellite service (active) in Regions 1 and 3. WRC-23 therefore lacks the technical basis for taking a decision on a new allocation to AMS in the frequency band 10.0-10.5 GHz in Region 2. The RCC Administrations consider that, in view of the foregoing, WRC-23 can only examine the question of an allocation to the mobile, except aeronautical mobile, service in the frequency band 10.0-10.5 GHz.

The RCC Administrations note that all three Regions currently have the same allocations in the frequency band 10.45-10.5 GHz, and the creation of a new allocation to the mobile or the mobile, except aeronautical mobile, services in Region 2 would disrupt the globally harmonized use of this band. The RCC Administrations therefore consider it inadvisable for WRC-23 to introduce any new allocations in the frequency band 10.45-10.5 GHz for Region 2 alone.

Frequency band 6 425-7 125 MHz

The RCC Administrations support the identification of the frequency band 6 425-7 100 MHz for IMT systems, but no additional regulatory or technical constraints should be imposed on FSS earth stations, FS stations, or the space operation service or the space research service stations operating in the frequency band 7 100-7 250 MHz. In addition, the possibility of continuing to use the Earth exploration-satellite service (EESS) (passive) in the frequency band 7 075-7 250 MHz must be maintained.

The RCC Administrations consider that unwanted emissions of IMT stations must meet the requirements of Recommendation ITU-R SM.329 for Category B, which will ensure that services operating above 7 100 MHz are protected.

The RCC Administrations consider that the protection of the radioastronomy service in the frequency band 6 650-6 675.2 MHz must be provided on the basis of the provisions of No. **5.149** and no additional measures are required.

The RCC Administrations consider that the existing regulatory and technical provisions in Article **21** of the Radio Regulations are sufficient to ensure the compatibility of IMT systems with stations in the FSS (Earth-to-space) in the frequency band 6 425-7 100 MHz, but their compatibility with advanced antenna systems will require that an e.i.r.p. spectral density mask is to be established in the frequency band 6 425-6 525 MHz for IMT base stations.

The RCC Administrations consider that, to assist interested administrations in planning to use IMT in the frequency band 6 425-7 100 MHz, ITU-R should be instructed to develop ITU-R Recommendations and Reports regarding the method for determining the protection area around non-GSO earth stations operating in the frequency band 6 700-7 075 MHz from IMT base stations, and to update existing ITU-R Recommendations and Reports, or to develop new ITU-R Recommendations regarding possible coordination of FS stations with IMT stations in the frequency band 6 425-7 100 MHz.

Proposals

ARTICLE 5

Frequency allocations

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

NOC RCC/85A2/1

2 700-3 600 MHz

|  |
| --- |
| Allocation to services |
| Region 1 | Region 2 | Region 3 |
| 3 300-3 400RADIOLOCATION | 3 300-3 400RADIOLOCATIONAmateurFixedMobile | 3 300-3 400RADIOLOCATIONAmateur |
| 5.149 5.429 5.429A 5.429B 5.430  | 5.149 5.429C 5.429D | 5.149 5.429 5.429E 5.429F |

NOC RCC/85A2/2

5.429A *Additional allocation*:  in Angola, Benin, Botswana, Burkina Faso, Burundi, Djibouti, Eswatini, Ghana, Guinea, Guinea-Bissau, Lesotho, Liberia, Malawi, Mauritania, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sudan, South Sudan, South Africa, Tanzania, Chad, Togo, Zambia and Zimbabwe, the frequency band 3 300‑3 400 MHz is allocated to the mobile, except aeronautical mobile, service on a primary basis. Stations in the mobile service operating in the frequency band 3 300-3 400 MHz shall not cause harmful interference to, or claim protection from, stations operating in the radiolocation service.     (WRC‑19)

NOC RCC/85A2/3

5.429B In the following countries of Region 1 south of 30° parallel north: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Congo (Rep. of the), Côte d’Ivoire, Egypt, Eswatini, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Malawi, Mauritania, Mozambique, Namibia, Niger, Nigeria, Uganda, the Dem. Rep. of the Congo, Rwanda, Sudan, South Sudan, South Africa, Tanzania, Chad, Togo, Zambia and Zimbabwe, the frequency band 3 300-3 400 MHz is identified for the implementation of International Mobile Telecommunications (IMT). The use of this frequency band shall be in accordance with Resolution **223 (Rev.WRC‑19)**. The use of the frequency band 3 300-3 400 MHz by IMT stations in the mobile service shall not cause harmful interference to, or claim protection from, systems in the radiolocation service, and administrations wishing to implement IMT shall obtain the agreement of neighbouring countries to protect operations within the radiolocation service. This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations.     (WRC‑19)

**Reasons:** The conditions for the utilization of frequency band 3 300-3 400 MHz by IMT stations (not to cause interference to or claim protection from the radiolocation service) were established by WRC-19, and there is no provision in Resolution **245 (WRC-19)** for them to be changed. The RCC countries are therefore in favour of maintaining the conditions for the protection of stations in the radiolocation service set out in RR Nos. **5.429А** and **5.429B**.

 RCC/85A2/4

Not to change the category of the allocation to the aeronautical mobile service in the frequency band 3 300-3 400 MHz in countries of Region 2 bordering Regions 1 and 3.

**Reasons:** ITU-R has not examined compatibility for AMS, so upgrading the allocation to AMS in the frequency band 3 300-3 400 MHz from secondary to primary in countries of Region 2 bordering countries of Regions 1 and 3 would create uncertainty regarding the risk of interference being caused to stations in the primary services in Regions 1 and 3.

ARTICLE 5

Frequency allocations

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

MOD RCC/85A2/5

2 700-3 600 MHz

|  |
| --- |
| Allocation to services |
| Region 1 | Region 2 | Region 3 |
| 3 300-3 400RADIOLOCATION | 3 300-3 400RADIOLOCATIONAmateurFixedMobile | 3 300-3 400RADIOLOCATIONAmateur |
| 5.149 5.429 5.429A 5.429B ADD 5.429C ADD 5.429D 5.430  | 5.149 5.429C 5.429D | 5.149 5.429 ADD 5.429C ADD 5.429D 5.429E 5.429F |

**Reasons:** To clarify that the provisions to protect the radiolocation service in Region 2 from interference from primary allocations to the mobile and fixed services, as specified in RR Nos. **5.429С** and **5.429D** (“Stations in the fixed and mobile services… shall not cause harmful interference to, or claim protection from, stations operating in the radiolocation service”), apply also to stations of the radiolocation service in Regions 1 and 3.

 RCC/85A2/6

If the frequency band 3 600-3 800 MHz or part thereof is identified for IMT in countries of Region 2 bordering countries of Region 1, it will be necessary to ensure the protection of the FSS and FS and the future development of those services in countries of Region 1; to this end, a provision must be included in the Radio Regulations specifying that stations in the mobile service in Region 2 must not claim protection from or cause interference to FSS and FS stations in Region 1, and, when assessing the impact of stations in the mobile service in Region 2 on FSS and FS stations in Region 1, the identification of affected stations must use the long-term and short-term protection criteria.

**Reasons:** The identification of frequency band 3 600-3 800 MHz or part thereof for IMT in Region 2 must not constrain the development of the FSS and FS in countries of Region 1.

 RCC/85A2/7

No changes to the Radio Regulations for the aeronautical mobile service in the frequency band 10.0-10.45 GHz.

**Reasons:** ITU-R has not conducted compatibility studies with the AMS, so a new allocation to the AMS in the frequency band 10.0-10.45 GHz for Region 2 would create uncertainty regarding the risk of interference being caused to stations in the primary services in Regions 1 and 3.

ARTICLE 5

Frequency allocations

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

NOC RCC/85A2/8

10-10.7 GHz

|  |
| --- |
| Allocation to services |
| Region 1 | Region 2 | Region 3 |
| 10.45-10.5 RADIOLOCATION Amateur Amateur-satellite 5.481 |

**Reasons:** Changing the allocation in frequency band 10.45-10.5 GHz in Region 2 would disrupt the globally harmonized use of this band.

MOD RCC/85A2/9

5 570-6 700 MHz

|  |
| --- |
| Allocation to services |
| Region 1 | Region 2 | Region 3 |
| 5 925-6 700 FIXED 5.457 FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B MOBILE 5.457C ADD 5.B12 5.149 5.440 5.458 |

MOD RCC/85A2/10

6 700-7 250 MHz

|  |
| --- |
| Allocation to services |
| Region 1 | Region 2 | Region 3 |
| 6 700-7 075 FIXED FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.441 MOBILE ADD 5.B12 5.458 5.458A 5.458B |
| 7 075-7 145 FIXED MOBILE ADD 5.B12 5.458 5.459 |

ADD RCC/85A2/11

5.B12 The frequency bands 6 425–7 100 MHz in Region 1 and 7 025-7 100 MHz in Regions 2 and 3 are identified for use by administrations wishing to implement the terrestrial component of International Mobile Telecommunications (IMT). This identification does not preclude the use of these frequency bands by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. Resolution **[RCC/A12**–**6 GHz] (WRC‑23)** applies.     (WRC-23)

**Reasons:** Make available a contiguous portion of spectrum for the creation and development of effective IMT-2020 and IMT-2030 systems and ensure harmonized development and use of spectrum by IMT systems in countries in Regions 1, 2 and 3.

ADD RCC/85A2/12

Draft New Resolution [RCC/A12–6 GHz] (WRC‑23)

Terrestrial component of International Mobile Telecommunications in the frequency band 6 425-7 100 MHz

The World Radiocommunication Conference (Dubai, 2023),

considering

*a)* that International Mobile Telecommunications (IMT), including IMT‑2000, IMT‑Advanced and IMT‑2020, is the ITU vision of global mobile access, and is intended to provide telecommunication coverage on a worldwide or regional scale, regardless of location and type of network or terminal;

*b)* that harmonized worldwide frequency bands for IMT are desirable in order to achieve global roaming and the benefits of economies of scale;

*с)* that ITU‑R has studied, in preparation for WRC‑23, sharing and compatibility with services allocated in the frequency bands 6 425-7 025 MHz and 7 025-7 100 MHz, and their adjacent bands, as appropriate, based on characteristics available at that time, and results may change if these characteristics change;

*d)* that it is assumed that a very limited number of IMT base stations will be communicating with a positive elevation angle towards IMT indoor mobile stations;

*e)* that the frequency band 6 425-7 100 MHz, or part thereof, is allocated on a primary basis to the fixed, mobile, fixed-satellite (Earth-to-space and space-to-Earth) and space operation services (Earth-to-space);

*f)*  that, in Region 1, the frequency band 6 425-6 525 MHz (Earth-to-space) is extensively used by the existing satellite networks/systems of the fixed-satellite service (FSS) with characteristics that may evolve in the future;

*g)* that the frequency band 7 100-7 155 MHz is allocated on a primary basis to the space operation services (Earth-to-space), and ensuring compatibility with IMT stations in a shared band is problematic;

*h)* that No. **5.458** states that in the frequency band 6 425-7 075 MHz passive microwave sensor measurements are carried out over the oceans, and in the frequency band 7 075–7 250 MHz passive microwave sensor measurements are carried out;

*i)* that, in the frequency band 6 650-6 675.2 MHz, radio astronomy observations are carried out under No.**5.149**,

noting

*a)* Resolutions **223 (Rev.WRC‑19)**, **224 (Rev.WRC‑19)**, **225 (Rev.WRC‑12)**, **241 (WRC‑19)**, **242 (WRC‑19)** and **243 (WRC‑19)**, which also relate to IMT;

*b)* that the IMT terrestrial radio interfaces as defined in Recommendations ITU‑R M.1457, ITU‑R M.2012 and ITU‑R M.2150 are expected to evolve within the framework of ITU‑R beyond those initially specified, to provide enhanced services and services beyond those envisaged in the initial implementation;

*c)* that ITU‑R has developed its vision defining the framework and overall objectives of IMT towards 2030 and beyond to drive the future developments for IMT;

*d)* that Article **21** of the Radio Regulations establishes power limits for terrestrial stations in order to ensure an interference-free environment for terrestrial and space services sharing frequency bands above 1 GHz that were developed for non-advanced antenna system (non‑AAS) stations of mobile and fixed services;

*e)* that ITU‑R is studying the application of No. **21.5** to IMT stations that use an antenna that consists of an array of active elements,

recognizing

*a)* that the identification of a frequency band for IMT does not establish priority in the Radio Regulations and does not preclude the use of the frequency band by any application of the services to which it is allocated;

*b)* that the spurious emission limits of Recommendation ITU-R SM.329 Category B are sufficient to protect the satellite services in the band above 7 100 MHz from IMT base station emissions in the frequency band 6 425-7 100 MHz;

*c)* that the protection of feeder links for the non-geostationary-satellite orbit (non-GSO) fixed-satellite service (space-to-Earth) requires the determination of protection distances, which depend on the propagation parameters, local terrain topography, and station and orbital parameters of the feeder links for non-GSO FSS (space-to-Earth),

resolves

1 that administrations wishing to implement IMT consider use of the frequency band 6 425-7 100 MHz identified for IMT in No. **5.B12**, taking into account the latest relevant ITU‑R Recommendations;

2 that administrations wishing to implement IMT in the frequency band 6 425-7 100 MHz shall apply the following conditions to IMT stations, in addition to those set out in Article **21**, in order to ensure the protection, continued use and future development of satellite services in this frequency band and in the adjacent band above 7 100 MHz:

2.1 in the frequency band 6 425-6 525 MHz, IMT base stations shall comply with a limit on the expected e.i.r.p. spectral density as a function of vertical (elevation) angle as specified in Table below:

Table

Limitation of expected e.i.r.p. spectral density for IMT base stations
as a function of the vertical angle above the horizon

|  |  |
| --- | --- |
| **Vertical angle above the horizon** | **Expected e.i.r.p. spectral density(dBm/MHz) (NOTES 1, 2, 3)**  |
| 0° ≤ θ < 5° | 32 |
| 5° ≤ θ < 10° | 29 |
| 10° ≤ θ < 15° | 22 |
| 15° ≤ θ < 20° | 19 |
| 20° ≤ θ < 25° | 17 |
| 25° ≤ θ < 30° | 15 |
| 30° ≤ θ < 60° | 15 |
| 60° ≤ θ ≤ 90° | 15 |

NOTE 1: The expected e.i.r.p. spectral density is defined as the average value of the e.i.r.p. spectral density, with the averaging being performed:

– over horizontal angles between −180° and +180°, and the IMT base station beamforming in a specific direction within its steering range;

– over different beamforming directions within the IMT base station steering range;

– for the specified range of the vertical angle θ.

NOTE 2: The IMT base station shall comply with the specified limits on expected e.i.r.p. spectral density for all mechanical downtilts that it can be deployed with.

NOTE 3: In calculating the expected e.i.r.p. spectral density, the beamforming directions used for the averaging procedure shall be used with the same probability in the horizontal and vertical directions within the steering range of the IMT base station.

2.2 the limits on expected e.i.r.p. spectral density in the frequency band 6 425-6 525 MHz given in *resolves* 2.1 shall remain in force pending the revision of Article **21** of the Radio Regulations by a future competent WRC with respect to stations in the mobile service with advanced antenna systems in this band;

2.3 in the frequency band 7 100-7 155 MHz the levels of spurious emissions must remain within the limits given in Recommendation ITU-R SM.329 for Category B;

2.4 IMT stations shall not constrain the use of frequency band 7 145-7 190 MHz by transmitting earth stations in the space research service (deep space) that meet the requirements of Appendix **3** of the Radio Regulations regarding the level of unwanted emissions of earth stations in the space services,

*invites the ITU Radiocommunication Sector*

1 to develop harmonized frequency arrangements to facilitate IMT deployment in the frequency band 6 425-7 100 MHz;

2 to develop ITU-R Recommendations/Reports to address methods for the determination of the protection area around non-GSO earth stations in the frequency band 6 700-7 075 MHz, from an IMT base station;

3 to update existing ITU‑R Recommendations/Reports or develop new ITU‑R Recommendations, as appropriate, to provide information and assistance to the administrations concerned on possible coordination of FS stations with IMT stations in the frequency band 6 425-7 100 MHz,

*instructs the Director of the Radiocommunication Bureau*

to bring this Resolution to the attention of relevant international organizations.

**Reasons:** To ensure the protection of satellite reception when IMT stations are being utilized in the frequency band 6 425-7 100 MHz by applying masks to IMT base stations for the expected e.i.r.p. spectral density and limits on unwanted emissions in the frequency band above 7 100 MHz.

SUP RCC/85A2/13

RESOLUTION 245 (WRC‑19)

Studies on frequency-related matters for the terrestrial component of International Mobile Telecommunications identification in the frequency bands 3 300-3 400 MHz, 3 600-3 800 MHz, 6 425-7 025 MHz,
7 025-7 125 MHz and 10.0-10.5 GHz

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