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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 to Document 130-E** | |
|  | | **27 October 2023** | |
|  | | **Original: English** | |
|  | | | |
| Tanzania (United Republic of) | | | |
| 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)**;

ARTICLE 5

Frequency allocations

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

MOD TZA/130A2/1#1347

2 700-3 600 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 3 300-3 400  MOBILE  RADIOLOCATION | 3 300-3 400  RADIOLOCATION  Amateur  Fixed  Mobile | 3 300-3 400  RADIOLOCATION  Amateur | |
| 5.149 5.429 5.429B 5.430 ADD 5.A12‑1F | 5.149 5.429C 5.429D | 5.149 5.429 5.429E 5.429F | |

SUP TZA/130A2/2#1348

5.429A

ADD TZA/130A2/3#1349

5.A12-1F In Region 1, the frequency band 3 300-3 400 MHz is identified for International Mobile Telecommunications (IMT). 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. The use of this frequency band shall be in accordance with Resolution **223 (Rev.WRC‑19)**.     (WRC‑23)

MOD TZA/130A2/4#1363

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.B12-4E  5.149 5.440 5.458 | | |

ADD TZA/130A2/5#1368

5.B12-4E In Region 1, the frequency band 6 425-7 025 MHz is identified for use by administrations wishing to implement the terrestrial component of International Mobile Telecommunications (IMT). The use is expected as of 2030, taking into account the need for transition time for some existing users of the spectrum. 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. Resolution**[A12-6GHz] (WRC‑23)** applies.     (WRC‑23)

MOD TZA/130A2/6#1372

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.B12-4E ADD 5.C12-5E  5.458 5.458A 5.458B | | |
| 7 075-7 145 FIXED  MOBILE ADD 5.C12-5E  5.458 5.459 | | |

ADD TZA/130A2/7#1376

5.C12-5E The frequency band 7 025-7 125 MHz, or portions thereof, is identified for use by administrations wishing to implement the terrestrial component of International Mobile Telecommunications (IMT). The use is expected as of 2030, taking into account the need for transition time for existing users of the spectrum. 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. Resolution **[A12-6GHz] (WRC‑23)** applies.     (WRC‑23)

ADD TZA/130A2/8#1370

draft new Resolution [A12-6 GHz] (WRC‑23)

Terrestrial component of International Mobile Telecommunications in the frequency band 6 425-7 025 MHz in Region 1 and 7 025-7 125 MHz in all Regions

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 services on a worldwide 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;

*c)* that identification of frequency bands allocated to the mobile service for IMT may change the sharing situation regarding applications of services to which the frequency band is already allocated, and may require regulatory actions;

*d)* that the ITU Radiocommunication Sector (ITU‑R) has studied, in preparation for WRC‑23, sharing and compatibility with services allocated in the frequency band 6 425-7 025 MHz and 7 025-7 125 MHz, and its adjacent band, as appropriate, based on characteristics available at that time, and results may change if these characteristics change;

*[For Methods 4C, 4E, 5C, 5D and 5E]*

*e)* 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;

*or*

*e)* that it is assumed that IMT base stations would be communicating with a negative elevation angle towards IMT mobile stations;

*f)* that the frequency band 6 425-7 125 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);

*[For Methods 4C, 4E, 5C, 5D and 5E]*

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

*[For Methods 4C, 4E, 5C, 5D and 5E]*

*h)* 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;

*[For Methods 4C, 4E, 5C and 5E]*

*d)* 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;

*[For Methods 4C, 4E, 5C and 5E]*

*b)* that studies have shown that the protection of feeder links for the non-geostationary-satellite orbit (non-GSO) fixed-satellite service (FSS) (space-to-Earth) requires the determination of protection distances ranging between a few kilometres to tens of kilometres. These protection distances are site-specific and depend on several elements, such as the propagation parameters, local terrain topography, station and orbital parameters of the feeder links for non-GSO FSS (space-to-Earth);

*[For Methods 4E and 5E]*

*c)* that the frequency band 6 425-7 125 MHz is expected to be implemented as of 1 January 2030 in time to help meet the spectrum requirement of future systems for 2030 and beyond and to enable the migration of some other services and applications to other bands, e.g. surface sea temperature satellite observations (see No. **5.458**) or fixed links in areas where IMT would be deployed, if considered necessary by national administrations,

*[For Methods 4C and 5C]*

*d)* that the frequency band 6 425-7 125 MHz is expected to be implemented as of 1 January 2024, in time to help meet the spectrum requirement of IMT-2020 systems and beyond,

*[For Method 5D]*

*e)* that the frequency band 7 100-7 155 MHz is allocated on a primary basis to the SOS (Earth-to-space),

resolves

1 that administrations wishing to implement IMT consider use of the frequency band 6 425-7 025 MHz identified for IMT in No. **5.B12** in Region 1 and 7 025-7 125 MHz identified for IMT in all Regions in No. **5.C12**, taking into account the latest relevant ITU‑R Recommendations;

*[For Methods 4B and 5B]*

2 not used;

*[For Methods 4C, 4E and 5C, 5D and 5E]*

2 that administrations wishing to implement IMT in the frequency band 6 425-7 075 MHz shall apply the following conditions to IMT to ensure the protection, continued use and future development of the fixed-satellite service (Earth-to-space):

*[Example 1]*

2.1 take practical measures to ensure the transmitting antennas of outdoor base stations are normally pointing below the horizon when deploying IMT base stations within the frequency band 6 425-7 075 MHz; the mechanical pointing needs to be at or below the horizon;

2.2 that, in the frequency band 6 425-7 075 MHz, the power delivered by a transmitter to the antenna of an IMT station not using active antenna system (AAS) or the total radiated power (TRP) for an IMT station using active antenna system (AAS), shall not exceed 13 dBW;

*[Example 2]*

2.1 the level of expected equivalent isotropically radiated power (e.i.r.p.) emitted by an IMT base station as a function of vertical angle above the horizon in the frequency band 6 425-7 025 MHz or part thereof shall not exceed the following values:

|  |  |
| --- | --- |
| Vertical angle measurement window θ*L* ≤ θ < θ*H* (vertical angle θ above horizon) | Expected e.i.r.p.  (dBm/MHz)  (NOTE 1) |
| 0° ≤ θ < 5° | 31.5 |
| 5° ≤ θ < 10° | 26.5 |
| 10°≤ θ < 15° | 22.5 |
| 15°≤ θ < 20° | 21.5 |
| 20°≤ θ < 30° | 19.5 |
| 30°≤ θ < 60° | 18.5 |
| 60°≤ θ ≤ 90° | 18.5 |
| NOTE 1: The expected e.i.r.p. is defined as the average value of the e.i.r.p., with the averaging being performed:  – over horizontal angles between −180° to +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, and  – over the specified vertical angle measurement window θ*L* ≤ θ < θ*H*. | |

2.2 (not used)

*[Example 3]*

2.1 the level of expected equivalent isotropically radiated power (e.i.r.p.) emitted by an IMT base station as a function of vertical angle above the horizon in the frequency band 6 425-7 025 MHz or parts thereof shall not exceed the following values:

|  |  |
| --- | --- |
| Vertical angle measurement window  θ*L ≤* θ *<* θ*H*  (vertical angle θabove horizon) | Expected e.i.r.p.  (dBm/MHz)  (NOTE 1) |
| 0° ≤θ < 5° | 32 |
| 5° ≤θ< 10° | 28 |
| 10° ≤ θ< 15° | 24 |
| 15° ≤ θ < 20° | 24 |
| 20° ≤ θ < 30° | 20 |
| 30° ≤ θ < 60° | 18 |
| 60° ≤ θ≤ 90° | 17 |
| NOTE 1: The expected e.i.r.p. is defined as the average value of the e.i.r.p., with the averaging being performed:  – over horizontal angles between −180° to +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, and  – over the specified vertical angle measurement window (θ*L*≤θ<θ*H*). | |

2.2 (not used)

*[Example 4]*

2.1 that, in the frequency band 6 425-6 525 MHz, IMT base stations with an active antenna system shall comply with a limit on expected e.i.r.p. as a function of vertical (elevation) angle.

Expected e.i.r.p. limits for IMT base stations

| Elevation angle | e.i.r.p,  dbm/100 mhz |
| --- | --- |
| 0 ≤ θ ≤ 5 | 56.9 |
| 5 < θ ≤ 10 | −2.346∙θ + 68.63 |
| 10 < θ ≤ 30 | −0.5904∙θ + 50.94 |
| 30 < θ ≤ 60 | 33.36 |
| 60 < θ ≤ 80 | 29.13 |

2.2 (not used)

*[Example 5]*

2.1 The following limit to the e.i.r.p. radiated by each IMT base station, in any bandwidth of 100 MHz, for a given elevation angle above the horizontal applies:

e.i.r.p. limits for IMT base stations

| Elevation angle (θ) degrees | **Maximum e.i.r.p.  dBW/100 MHz** |
| --- | --- |
| 0 ≤ θ ≤ 1 | 20.7 |
| 1 < θ ≤ 10 | 20.7 − 1.777(θ – 1) |
| 10 < θ ≤ 90 | 4.7 − 0.239(θ − 10) |

2.2 The average density of base stations operating in the territory of any administration, in any bandwidth of 100 MHz, not to exceed 0.0037 base stations per square kilometre;

*[[For Methods 4B and 5B]]*

3 (not used);

*[For Methods 4C, 4E and 5C, 5D and 5E]*

*[Example 1]*

3 that administrations wishing to implement IMT in the frequency band 6 700-7 075 MHz shall ensure the protection, continued use and future development of the fixed-satellite service (space-to-Earth) through the adoption of site-specific coordination;

3*bis* that IMT within the frequency range 6 700-7 075 MHz shall not be used by aeronautical applications,

*[Example 2]*

3 (not used);

3*bis* (not used),

encourages administrations

*[For Methods 4C and 4E]*

1 to ensure that provisions for the implementation of IMT does not adversely affect the operation of FSS earth stations and their future development;

*[For Method 4C and 4E]*

2 to keep the antenna pattern of IMT base stations within the limits of the approximation envelope according to Recommendation ITU‑R M.2101 and to implement suppression side lobe mitigation techniques;

*[For Method 4C and 4E]*

3 to take all practicable steps to protect the radio astronomy service from harmful interference in the frequency band 6 650-6 675.2 MHz, which covers spectral lines of importance for current astronomical investigations, in accordance with No. **5.149**,

invites administrations

to take into account the benefits of harmonized utilization of the spectrum for the terrestrial component of IMT,

invites the ITU Radiocommunication Sector

1 to develop harmonized frequency arrangements to facilitate IMT deployment in the frequency band 6 425-7 025 MHz in Region 1 and 7 025-7 125 MHz in all Regions;

2 to continue providing guidance to ensure that IMT can meet the telecommunication needs of developing countries;

*[For Methods 4C and 4E]*

3 to develop a recommendation to address methods for the determination of the protection area around a non-GSO earth station in the frequency band 6 700-7 075 MHz, from an IMT base station;

*[For Methods 4C and 4E]*

4 to regularly review, as appropriate, the impact of evolving technical and operational characteristics of IMT systems (including base-station density) on sharing and compatibility with space services, and to take into account the results of these reviews in the development and/or revision of ITU‑R Recommendations/Reports addressing, *inter alia*, if necessary, applicable measures to mitigate the risk of interference into space services;

*[For Methods 4C and 4E]*

5 to develop a recommendation to address methods for the determination of the protection area around existing radio astronomy service stations from IMT stations in the frequency band 6 650-6 675.2 MHz;

6 to update existing ITU‑R Recommendations/Reports or develop new ITU‑R Recommendations, as appropriate, to provide information and assistance to the concerned administrations on possible coordination of FS stations with IMT stations in the frequency band 6 425-7 125 MHz,

NOTE: WRC‑23 may consider extending this *invites ITU‑R* to 3 600-3 800 MHz and 10-10.5 GHz.

instructs the Director of the Radiocommunication Bureau

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

SUP TZA/130A2/9#1391

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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