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| **World Radiocommunication Conference (WRC-15) Geneva, 2–27 November 2015** |  |
| **INTERNATIONAL TELECOMMUNICATION UNION** |  |
|  |  |
| PLENARY MEETING | **Addendum 1 to Document 130-E** |
|  | **16 October 2015** |
|  | **Original: English** |
|  | |
| Angola (Republic of), Botswana (Republic of), Lesotho (Kingdom of), Madagascar (Republic of), Malawi, Mauritius (Republic of), Mozambique (Republic of), Namibia (Republic of), Democratic Republic of the Congo, Seychelles (Republic of), South Africa (Republic of),  Swaziland (Kingdom of), Tanzania (United Republic of),  Zambia (Republic of), Zimbabwe (Republic of) | |
| Proposals for the work of the conference | |
|  | |
| Agenda item 1.1 | |

1.1 to consider additional spectrum allocations to the mobile service on a primary basis and identification of additional frequency bands for International Mobile Telecommunications (IMT) and related regulatory provisions, to facilitate the development of terrestrial mobile broadband applications, in accordance with Resolution **233 (WRC‑12)**;

Introduction

WRC-15 agenda item 1.1 addresses the need for additional primary allocations to the mobile service and the identification of additional frequency bands for IMT. The Southern African Development Community (SADC) member states submitting this proposal view mobile broadband as a key enabler for social and economic development in the sub-region and it is therefore imperative that additional harmonized spectrum be allocated and/or identified for this purpose.

The ITU has calculated the amount of additional IMT spectrum needed by 2020 for both lower and upper user densities as reflected in the CPM Report. Whereas it is acknowledged that the current and future IMT spectrum requirements of individual SADC member states differ, the need for flexibility in spectrum use and regional/international harmonization are critical for SADC member states and therefore, in developing proposals under agenda item 1.1, the SADC member states support additional mobile allocations and IMT identification with the main view to achieve harmonization to the extent possible, while protecting incumbent services. This proposal also lists those frequency bands that are not supported for a mobile allocation and/or IMT identification.

Summary of SADC proposals on candidate frequency bands

Note: For the below two frequency bands there are no common SADC position yet;

− 2 700-2 900 MHz

− 3 300-3 400 MHz

The SADC administrations support the following frequency bands for mobile/IMT:

− 1 350-1 400 MHz (proposal contained in Annex 1)

− 1 427-1 518 MHz (proposal contained in Annex 1)

− 3 400-3 600 MHz (proposal contained in Annex 2)

The SADC administrations do not support the following candidate frequency bands for mobile/IMT:

− 470-694 MHz

− 1 518-1 525 MHz

− 1 695-1 710 MHz

− 3 600-3 800 MHz

− 3 800-4 200 MHz

− 4 400-5 000 MHz

− 5 350-5 470 MHz

− 5 725-5 850 MHz

− 5 925-6 425 MHz

In addition, the SADC administration do not support the following frequency bands for mobile/IMT (considered within JTG4-5-6-7 but not listed as candidate frequency bands):

− 410-430 MHz

− 1 300-1 350 MHz

− 2 025-2 110 MHz

− 2 200-2 290 MHz

− 2 900-3 100 MHz

Band specific proposals are contained in Annexes 1 and 2.

Annex 1

Frequency bands 1 350-1 400 MHz and 1 427-1 518 MHz

Introduction

The frequency bands 1 350-1 400 MHz and 1 427-1 518 MHz are currently used in SADC countries on a limited basis, mostly for point-to-point links. Further, these bands are already allocated to mobile services on a primary basis. It is also noted that the band 1 452-1 492 MHz is already earmarked for IMT in Europe and has been included as part of the 3GPP specifications. This provides an ideal opportunity for SADC to propose the identification of these bands for IMT. At this stage, noting the regional support for these bands, SADC administrations are proposing a country footnote for the band 1350-1400 MHz whereas a global allocation/identification is proposed for the band 1427-1518 MHz.

ARTICLE 5

Frequency allocations

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

MOD AGL/BOT/LSO/MDG/MWI/MAU/MOZ/NMB/COD/SEY/AFS/SWZ/TZA/ZMB/  
ZWE/130A1/1

1 300-1 525 MHz

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Allocation to services | | | | |
| Region 1 | Region 2 | | Region 3 | |
| 1 300-1 350 RADIOLOCATION  AERONAUTICAL RADIONAVIGATION 5.337  RADIONAVIGATION-SATELLITE (Earth-to-space)  5.149 5.337A | | | | |
| 1 350-1 400  FIXED  MOBILE except aeronautical mobile ADD 5.A11  RADIOLOCATION  5.149 5.338 MOD 5.338A 5.339 | 1 350-1 400  RADIOLOCATION 5.338A  5.149 5.334 5.339 | | | |
| 1 400-1 427 EARTH EXPLORATION-SATELLITE (passive)  RADIO ASTRONOMY  SPACE RESEARCH (passive)  5.340 5.341 | | | | |
| 1 427-1 429 SPACE OPERATION (Earth-to-space)  FIXED  MOBILE except aeronautical mobile ADD 5.B11  MOD 5.338A 5.341 | | | | |
| 1 429-1 452  FIXED  MOBILE except aeronautical mobile ADD 5.B11  MOD 5.338A 5.341 5.342 | | 1 429-1 452  FIXED  MOBILE 5.343 ADD 5.B11  5.338A 5.341 | | |
| 1 452-1 492  FIXED  MOBILE except aeronautical mobile ADD 5.B11  BROADCASTING  BROADCASTING-SATELLITE 5.208B  5.341 5.342 5.345 | | 1 452-1 492  FIXED  MOBILE 5.343 ADD 5.B11  BROADCASTING  BROADCASTING-SATELLITE 5.208B  5.341 5.344 5.345 | | |
| 1 492-1 518  FIXED  MOBILE except aeronautical mobile ADD 5.B11  5.341 5.342 | | 1 492-1 518  FIXED  MOBILE 5.343 ADD 5.B11  5.341 5.344 | | 1 492-1 518  FIXED  MOBILE ADD 5.B11  5.341 |

ADD AGL/BOT/LSO/MDG/MWI/MAU/MOZ/NMB/COD/SEY/AFS/SWZ/TZA/ZMB/  
ZWE/130A1/2

5.A11 The frequency band 1 350-1 400 MHz is identified for use by administrations wishing to implement International Mobile Telecommunications (IMT). This identification does not preclude the use of this 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 band for IMT is subject to the application of Resolution **750 (Rev.WRC‑15)**.     (WRC‑15)

**Reasons:** To identify the frequency band 1 350-1 400 MHz for IMT.

ADD AGL/BOT/LSO/MDG/MWI/MAU/MOZ/NMB/COD/SEY/AFS/SWZ/TZA/ZMB/  
ZWE/130A1/3

5.B11 The frequency band 1 427-1 518 MHz is identified for use by administrations wishing to implement International Mobile Telecommunications (IMT). This identification does not preclude the use of this band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. The use of the band 1 427-1 452 MHz for IMT is subject to the application of Resolution **750 (Rev.WRC‑15)**.     (WRC-15)

**Reasons:** To identify the frequency band 1 427-1 518 MHz for IMT on a global basis.

MOD AGL/BOT/LSO/MDG/MWI/MAU/MOZ/NMB/COD/SEY/AFS/SWZ/TZA/ZMB/  
ZWE/130A1/4

5.338A In the bands 1 350-1 400 MHz, 1 427-1 452 MHz, 22.55-23.55 GHz, 30-31.3 GHz, 49.7-50.2 GHz, 50.4-50.9 GHz, 51.4-52.6 GHz, 81-86 GHz and 92-94 GHz, Resolution **750 (Rev.WRC‑15)** applies.     (WRC‑15)

**Reasons:** To update Resolution 750 (Rev.WRC-12) with regards to the unwanted emission requirements relating to IMT.

ARTICLE 21

Terrestrial and space services sharing frequency bands above 1 GHz

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

MOD AGL/BOT/LSO/MDG/MWI/MAU/MOZ/NMB/COD/SEY/AFS/SWZ/TZA/ZMB/  
ZWE/130A1/5

TABLE **21-4**     (Rev.WRC‑15)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Frequency band | Service\* | Limit in dB(W/m2) for angles of arrival (δ) above the horizontal plane | | | Reference bandwidth |
| 0°-5° | 5°-25° | 25°-90° |
| 1 452-1 492 MHz7A | Broadcasting-satellite | [−113] | | | 1 MHz |

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

ADD AGL/BOT/LSO/MDG/MWI/MAU/MOZ/NMB/COD/SEY/AFS/SWZ/TZA/ZMB/  
ZWE/130A1/6

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7A  21.16.1A These limits do not apply over the territory of [list of countries].

**Reasons:** To ensure long-term protection of terrestrial systems, including IMT systems, from the broadcasting-satellite service. The list of countries would include those wishing to continue to apply the coordination procedure of No. 9.11 in Appendix 5.

APPENDIX 5 (REV.WRC‑12)

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

MOD AGL/BOT/LSO/MDG/MWI/MAU/MOZ/NMB/COD/SEY/AFS/SWZ/TZA/ZMB/ZWE/130A1/7

TABLE 5-1 (*continued*)     (Rev.WRC‑12)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Reference of Article 9 | Case | Frequency bands  (and Region) of the service  for which coordination  is sought | Threshold/condition | Calculation  method | Remarks |
| No. **9.11** GSO, non-GSO/ terrestrial | A space station in the BSS in any band shared on an equal primary basis with terrestrial services and where the BSS is not subject to a Plan, in respect of terrestrial services | 620-790 MHz (see Resolution **549 (WRC‑07)**) 1 452-1 492 MHz (only over the territory of countries listed in **21.16.1A**) 2 310-2 360 MHz (No. **5.393**) 2 535-2 655 MHz (Nos. **5.417A** and **5.418**) 17.7-17.8 GHz (Region 2)  74-76 GHz | Bandwidths overlap: The detailed conditions for the application of No. **9.11** in the bands 2 630-2 655 MHz and 2 605-2 630 MHz are provided in Resolution **539 (Rev.WRC‑03)** for non-GSO BSS (sound) systems pursuant to Nos. **5.417A** and **5.418**, and in Nos. **5.417A** and **5.418** for GSO BSS (sound) networks pursuant to those provisions. | Check by using the assigned frequencies and bandwidths |  |

**Reasons:** The list of countries would include those wishing to continue to apply the coordination procedure of No. 9.11 in Appendix 5.

MOD AGL/BOT/LSO/MDG/MWI/MAU/MOZ/NMB/COD/SEY/AFS/SWZ/TZA/ZMB/  
ZWE/130A1/8

RESOLUTION 750 (Rev.WRC‑15)

Compatibility between the Earth exploration-satellite service (passive) and relevant active services

...

TABLE 1-1

|  |  |  |  |
| --- | --- | --- | --- |
| EESS (passive) band | Active service band | Active service | Limits of unwanted emission power from active service stations in a specified bandwidth within the EESS (passive) band1 |
| 1 400-1 427 MHz | 1 375-1 400 MHz  1 427-1 452 MHz | Mobile | For IMT base stations: −80 dBW/27 MHz  For IMT mobile stations −65 dBW/27 MHz2 |
| 23.6-24.0 GHz | 22.55-23.55 GHz | Inter-satellite | −36 dBW in any 200 MHz of the EESS (passive) band for non-geostationary (non-GSO) inter-satellite service (ISS) systems for which complete advance publication information is received by the Bureau before 1 January 2020, and −46 dBW in any 200 MHz of the EESS (passive) band for non-GSO ISS systems for which complete advance publication information is received by the Bureau on or after 1 January 2020 |
| ... |  |  |  |
| 50.2-50.4 GHz | 49.7-50.2 GHz | Fixed-satellite (E‑to‑s)3 | For stations brought into use after the date of entry into force of the Final Acts of WRC‑07:  −10 dBW into the 200 MHz of the EESS (passive) band for earth stations having an antenna gain greater than or equal to 57 dBi  −20 dBW into the 200 MHz of the EESS (passive) band for earth stations having an antenna gain less than 57 dBi |
| 50.2-50.4 GHz | 50.4-50.9 GHz | Fixed-satellite (E-to-s)3 | For stations brought into use after the date of entry into force of the Final Acts of WRC‑07:  −10 dBW into the 200 MHz of the EESS (passive) band for earth stations having an antenna gain greater than or equal to 57 dBi  −20 dBW into the 200 MHz of the EESS (passive) band for earth stations having an antenna gain less than 57 dBi |
| 1 The unwanted emission power level is to be understood here as the level measured at the antenna port.  2 This value was derived assuming one UE is transmitting at an average output power of 15 dBm over all resource blocks (RB) per sector.  3 The limits apply under clear-sky conditions. During fading conditions, the limits may be exceeded by earth stations when using uplink power control. | | | |

TABLE 1-2

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| EESS (passive) band | Active service band | | Active service | | | Recommended maximum level of unwanted emission power from active service stations in a specified bandwidth within the EESS (passive) band1 | | |
| 1 400-1 427 MHz | 1 350-1 400 MHz | | ... | | | ... | | |
| 1 427-1 429 MHz | | Space operation (E-to-s) | | | −36 dBW in the 27 MHz of the EESS (passive) band | | |
| 1 427-1 429 MHz | | Mobile except aeronautical mobile | | | −60 dBW in the 27 MHz of the EESS (passive) band for mobile service stations except IMT stations and transportable radio-relay stations  −45 dBW in the 27 MHz of the EESS (passive) band for transportable radio-relay stations | | |
| Fixed | | | −45 dBW in the 27 MHz of the EESS (passive) band for point-to-point | | |
| 1 429-1 452 MHz | | Mobile | | | −60 dBW in the 27 MHz of the EESS (passive) band for mobile service stations except IMT stations and transportable radio-relay stations  −45 dBW in the 27 MHz of the EESS (passive) band for transportable radio-relay stations  −28 dBW in the 27 MHz of the EESS (passive) band for aeronautical telemetry stations3 | | |
| Fixed | | | −45 dBW in the 27 MHz of the EESS (passive) band for point-to-point | | |
| 31.3-31.5 GHz | 30.0-31.0 GHz | | Fixed-satellite (E‑to‑s)4 | | | −9 dBW into the 200 MHz of the EESS (passive) band for earth stations having an antenna gain greater than or equal to 56 dBi  −20 dBW into the 200 MHz of the EESS (passive) band for earth stations having an antenna gain less than 56 dBi | | |
| 86-92 GHz5 | | 81-86 GHz | | Fixed | −41 − 14(*f* − 86) dBW/100 MHz for 86.05 ≤ *f* ≤ 87 GHz  −55 dBW/100 MHz for 87 ≤ *f*≤ 91.95 GHz  where *f* is the centre frequency of the 100 MHz reference bandwidth expressed in GHz | | |
| 92-94 GHz | | Fixed | −41 − 14(92 − *f*) dBW/100 MHz for 91 ≤ *f* ≤ 91.95 GHz  −55 dBW/100 MHz for 86.05 ≤ *f* ≤ 91 GHz  where *f* is the centre frequency of the 100 MHz reference bandwidth expressed in GHz | | |
| ...  3 The band 1 429-1 435 MHz is also allocated to the aeronautical mobile service in eight Region 1 administrations on a primary basis exclusively for the purposes of aeronautical telemetry within their national territory (No. **5.342**).  4 The recommended maximum levels apply under clear-sky conditions. During fading conditions, these levels may be exceeded by earth stations when using uplink power control.  5 Other maximum unwanted emission levels may be developed based on different scenarios provided in Report ITU-R F.2239 for the band 86-92 GHz.  ... | | | | | | |

**Reasons:** Apply mandatory unwanted emission levels applicable to IMT (base stations and mobile stations) operating in the bands 1 375-1 400 MHz and 1 427-1 452 MHz in accordance with Report ITU-R RS.2336 to ensure the protection of EESS (passive) in the band 1 400-1 427 MHz.

MOD AGL/BOT/LSO/MDG/MWI/MAU/MOZ/NMB/COD/SEY/AFS/SWZ/TZA/ZMB/  
ZWE/130A1/9

RESOLUTION 223 (Rev.WRC‑15)

Additional frequency bands identified for IMT

The World Radiocommunication Conference (Geneva, 2015),

considering

*...*

*u)* that ITU‑R studies forecasted that additional spectrum may be required to support the future services of IMT and to accommodate future user requirements and network deployments;

*v)* that WRC‑15 identified the band 1 427-1 518 MHz for IMT in No. **5A11** and No. **5B11**;

*w)* that the frequency band 1 518-1 525 MHz is allocated to the mobile-satellite service;

*x)* that there is a need to ensure the coexistence between IMT systems operating below 1 518 MHz and MSS operating above 1 518 MHz,

...

invites ITU‑R

...

5 to include these frequency arrangements and the results of these studies in one or more ITU‑R Recommendations;

6 to develop an ITU‑R Recommendation providing technical measures regarding adjacent band compatibility between IMT systems operating below 1 518 MHz and MSS systems operating above 1 518 MHz.

**Reasons:** Studies pertaining to adjacent band compatibility between MSS and IMT operating above and below 1 518 MHz respectively are ongoing in Europe. Amendment to Resolution 223 as proposed will ensure that these studies are concluded within ITU-R and the results captured in an ITU-R Recommendation.

Annex 2

Frequency band 3 400-3 600 MHz

Introduction

SADC administrations are of the view that there is sufficient Regional support for IMT in the frequency band 3400-3600 MHz to convert the current footnote allocations to an allocation in the Table of Frequency Allocations. Although it is evident that there is substantial support for IMT in this band (or parts thereof) also in Regions 2 and 3, SADC administrations restricted their proposal to Region 1 only. Further, SADC propose that the protection criteria currently in No. 5.430A be retained as some SADC countries do not support IMT in this band.

ARTICLE 5

Frequency allocations

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

MOD AGL/BOT/LSO/MDG/MWI/MAU/MOZ/NMB/COD/SEY/AFS/SWZ/TZA/ZMB/  
ZWE/130A1/10

2 700-4 800 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 3 400-3 600  FIXED  FIXED-SATELLITE (space-to-Earth)  MOBILE except aeronautical MOD 5.430A  Radiolocation  5.431 | 3 400-3 500  FIXED  FIXED-SATELLITE (space-to-Earth)  Amateur  Mobile 5.431A  Radiolocation 5.433  5.282 | 3 400-3 500  FIXED  FIXED-SATELLITE (space-to-Earth)  Amateur  Mobile 5.432B  Radiolocation 5.433  5.282 5.432 5.432A |
| 3 500-3 700  FIXED  FIXED-SATELLITE (space-to-Earth)  MOBILE except aeronautical mobile  Radiolocation 5.433 | 3 500-3 600  FIXED  FIXED-SATELLITE (space-to-Earth)  MOBILE except aeronautical mobile 5.433A  Radiolocation  5.433 |

**Reasons:** SADC administrations supports a Regional allocation to Mobile except aeronautical mobile on a primary basis and identification of the band 3 400-3 600 MHz for IMT.

MOD AGL/BOT/LSO/MDG/MWI/MAU/MOZ/NMB/COD/SEY/AFS/SWZ/TZA/ZMB/  
ZWE/130A1/11

5.430A The frequency band 3 400-3 600 MHz is identified for administrations wishing to implement International Mobile Telecommunications (IMT). This identification does not preclude the use of this band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. At the stage of coordination the provisions of Nos. **9.17** and **9.18** also apply. Before an administration brings into use a (base or mobile) station of the mobile service in this band, it shall ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed −154.5 dB(W/(m2 ⋅ 4 kHz)) for more than 20% of time at the border of the territory of [Angola]. This limit may be exceeded on the territory of any country whose administration has so agreed. In order to ensure that the pfd limit at the border of the territory of these administrations are met, the calculations and verification shall be made, taking into account relevant ITU‑R Recommendations. Stations of the mobile service in the band 3 400‑3 600 MHz shall not claim more protection from space stations than that provided in Table **21‑4** of the Radio Regulations (Edition of 2004).     (WRC‑15)

**Reasons:** SADC administrations support a Regional allocation to the Mobile service in the band 3 400‑3 600 MHz and its identification for IMT.

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