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| **World Radiocommunication Conference (WRC-15)Geneva, 2–27 November 2015** |  |
| **INTERNATIONAL TELECOMMUNICATION UNION** |  |
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| PLENARY MEETING | **Document 48-E** |
|  | **10 September 2015** |
|  | **Original: Arabic** |
|  |
| United Arab Emirates |
| PROPOSALS FOR THE WORK OF CONFERENCE |
|  |
| Agenda item 1.10 |

1.10 to consider spectrum requirements and possible additional spectrum allocations for the mobile-satellite service in the Earth-to-space and space-to-Earth directions, including the satellite component for broadband applications, including International Mobile Telecommunications (IMT), within the frequency range from 22 GHz to 26 GHz, in accordance with Resolution **234 (WRC‑12)**;

Introduction

WRC-12 adopted WRC-15 agenda item 1.10 in order to consider additional allocations to the MSS, taking into account ITU-R studies in accordance with Resolution **234 (WRC-12)**. Resolution **234 (WRC-12)** invites the ITU-R to complete, for WRC-15, sharing and compatibility studies towards additional allocations to the MSS in the Earth-to-space and space-to-Earth directions, within portions of the bands between 22 GHz and 26 GHz.

The proposal below is based upon making the MSS allocation secondary in relation to the fixed service, such that the earth stations in the new allocation do not claim protection from the FS in the case of the downlink band 24.25 GHz-24.55 GHz. Likewise, MSS earth stations operating in the uplink band 25.25-25.5 GHz shall not cause harmful interference to the FS in this band. This is achieved through the addition of a footnote to the Table of Frequency Allocations, as shown in the proposal.

Proposal:

The proposing Administration supports one or more of the following methods:

Method A

To allocate the frequency band 24.25-24.55 GHz to the MSS (space-to-Earth) on the following conditions :

– MSS allocation shall be limited only to geostationary systems;

– Application of pfd limits (see Table 4.2/1.10/4.3-2) for MSS transmitting space stations in the frequency band 24.25-24.55 GHz;

– Coordination of MSS stations under RR No. 9.7;

– Coordination with non-geostationary satellites in the band 24.45-24.55 GHz operating in the ISS under RR No. 9.13;

– MSS earth stations operating in the band 24.25-24.55 GHz shall not claim protection from the FS in this band.

Method B

To allocate the frequency band 25.25-25.5 GHz to the MSS (space-to-Earth) on the following conditions:

– MSS allocation shall be limited only to geostationary systems;

– Coordination with geostationary satellites operating in the ISS under RR No. 9.7;

– Coordination with non-geostationary satellites operating in the ISS under RR No. 9.11A;

– MSS earth stations operating in the band 25.25-25.5 GHz shall not cause harmful interference to the FS in this band;

– Determination of the distance to avoid interference to the FS from shipborne mobile earth stations.

Regulatory and procedural considerations for Method A: Allocation of the frequency band 24.25-24.55 GHz to the MSS (space-to-Earth):

ARTICLE 5

Frequency allocations

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

MOD UAE/48/1

22-24.75 GHz

|  |
| --- |
| Allocation to services |
| Region 1 | Region 2 | Region 3 |
| 24.25-24.45FIXED MOBILE-SATELLITE (Earth-to-space) ADD 5.A110 ADD 5.B110 | 24.25-24.45MOBILE-SATELLITE (Earth-to-space) ADD 5.A110 ADD 5.B110RADIONAVIGATION | 24.25-24.45RADIONAVIGATIONFIXEDMOBILE MOBILE-SATELLITE (Earth-to-space) ADD 5.A110 ADD 5.B110 |
| 24.45-24.55FIXEDINTER-SATELLITE MOBILE-SATELLITE (Earth-to-space) ADD 5.A110 ADD 5.B110 | 24.45-24.55INTER-SATELLITE MOBILE-SATELLITE (Earth-to-space) ADD 5.A110 ADD 5.B110RADIONAVIGATION | 24.45-24.55FIXEDINTER-SATELLITEMOBILEMOBILE-SATELLITE (Earth-to-space) ADD 5.A110 ADD 5.B110RADIONAVIGATION |
|  | 5.533 | 5.533 |
| 24.55-24.65FIXEDINTER-SATELLITE | 24.55-24.65INTER-SATELLITERADIONAVIGATION | 24.55-24.65FIXEDINTER-SATELLITEMOBILERADIONAVIGATION |
|  | 5.533 | 5.533 |

ADD UAE/48/2

5.A110In the frequency band 24.25-24.55 GHz, MSS use is limited to geostationary systems exclusively. Coordination with non-geostationary satellites operating in the band 24.45-24.55 GHz shall be under No. **9.13**.    (WRC‑15)

ADD UAE/48/3

5.B110 MSS earth stations operating in the band 24.25-24.55 GHz shall not claim protection from the FS in this band. No.**5.43A** shall not apply.    (WRC‑15)

**Reasons**: To ensure that no constraints are imposed on the current or future FS.

ARTICLE 21

Terrestrial and space services sharing frequency bands above 1 GHz

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

MOD UAE/48/4

TABLE **21-4**  (*continued*)     (Rev.WRC‑15)

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency band | Service\* | Limit in dB(W/m2) for anglesof arrival (δ) above the horizontal plane | Reference bandwidth |
| 0°-5° | 5°-25° | 25°-90° |
| 19.3-19.7 GHz 21.4-22 GHz (Regions 1 and 3)22.55-23.55 GHz24.25-24.75 GHz25.25-27.5 GHz27.500-27.501 GHz | Fixed-satellite(space-to-Earth)Broadcasting-satelliteEarth exploration-satellite (space-to-Earth)Mobile-satellite (space-to-Earth)Inter-satelliteSpace research(space-to-Earth) | −115 13A | −115 + 0.5(δ − 5) 13A | −105 13A | 1 MHz |

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 UAE/48/5

TABLE 5-1     (Rev.WRC‑12)

Technical conditions for coordination

(see Article 9)

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ReferenceofArticle 9 | Case | Frequency bands(and Region) of the service for which coordinationis sought | Threshold/condition | Calculation method | Remarks |
| No. **9.7**GSO/GSO (cont.) |  | 10) 24.25-24.55 GHz | i) Bandwidths overlapii) Any network in the inter-satellite service (ISS) or MSS and any associated space operation functions with a GSO space station within an orbital arc of ±8° of the nominal orbital position of a proposed network in the MSS or ISS |  | An administration may request, pursuant to No.**9.41**, to be included in requests for coordination, indicating the networks for which the value [TBD (see Note)] is attained |

Note: It is required to develop the criterion and estimation method for identifying the affected satellite networks under RR No. 9.41. Consequential amendments to RR No. 9.41 may also be required.

APPENDIX 7 (REV.WRC‑15)

MOD UAE/48/6

TABLE 8d     (Rev.WRC‑15)

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

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Receiving spaceradiocommunicationservice designation | Meteorological- satellite | Fixed-satellite | Fixed-satellite3 | Broadcasting-satellite | Mobile-satellite | Earth exploration-satellite4 | Earth exploration-satellite5 | Space research (deep space) | Space research | Fixed-satellite6 | Fixed-satellite5 | Mobile-satellite | Broadcasting-satellite, fixed‑satellite | Mobile-satellite | Radio-navigation-satellite |
|  |  |  |  |  |  |  |  |  | Unmanned | Manned |  |  |  |  |  |  |
| Frequency bands (GHz) | 18.0-18.4 | 18.8-19.3 | 19.3-19.7 | 21.4-22.0 | 22.65-22.95 | 25.5-27.0 | 25.5-27.0 | 31.8-32.3 | 37.0-38.0 | 37.5-40.5 | 37.5-40.5 | 39.5-40.5 | 40.5-42.5 | 43.5-47.0 | 43.5-47.0 |
| Transmitting terrestrial service designations | Fixed, mobile | Fixed, mobile | Fixed, mobile | Fixed, mobile | Fixed, mobile | Fixed, mobile | Fixed, mobile | Fixed, radio-navigation | Fixed, mobile | Fixed, mobile | Fixed, mobile | Fixed, mobile | Broadcasting, fixed | Mobile | Mobile |
| Method to be used | § 2.1 | § 2.1, § 2.2 | § 2.2 | § 1.4.5 | § 1.4.6 | § 2.2 | § 2.1 | § 2.1, § 2.2 | § 2.1, § 2.2 | § 2.2 | § 2.1 | § 1.4.6 | § 1.4.5, § 2.1 | § 1.4.6 | – |
| Modulation at earth station1 | N | N | N |  | N | N | N | N | N | N | N | N | – | N |  |
| Earth station interference parameters and criteria | *p*0 (%) |  | 0.05 | 0.003 | 0.01 |  |  | 0.25 | 0.25 | 0.001 | 0.1 | 0.001 | 0.02 | 0.003 |  |  |  |  |
| *n* |  | 2 | 2 | 1 |  |  | 2 | 2 | 1 | 1 | 1 |  | 2 |  |  |  |  |
| *p* (%) |  | 0.025 | 0.0015 | 0.01 |  |  | 0.125 | 0.125 | 0.001 | 0.1 | 0.001 |  | 0.0015 |  |  |  |  |
| *NL* (dB) |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 | 0 | 1 | 1 |  |  |  |  |
| *Ms* (dB) |  | 18.8 | 5 | 5 |  |  | 11.4 | 14 | 1 | 1 | 6.8 | 6 |  |  |  |  |
| *W* (dB) |  | 0 | 0 | 0 |  |  | 0 | 0 | 0 | 0 | 0 | 0 |  |  |  |  |
| Terrestrial station parameters | *E* (dBW) in *B* 2 | A |  | – | – |  |  | – | – | – | – | – | – | – | – |  |  |
| N | 40 | 40 | 40 | 40 | 40 | 42 | 42 | −28 | −28 | 35 | 35 | 35 | 44 | 40 | 40 |
| *Pt* (dBW) in *B* | A |  | – | – |  |  | – | – | – | – | – | – | – | – |  |  |
| N | −7 | −7 | −7 | −7 | -7 | −3 | −3 | −81 | −73 | −10 | −10 | −10 | −1 | −7 | −7 |
| *Gx* (dBi) |  | 47 | 47 | 47 | 47 | 47 | 45 | 45 | 53 | 45 | 45 | 45 | 45 | 45 | 47 | 47 |
| Reference bandwidth6 | *B* (Hz) |  | 107 | 106 | 106 |  |  | 107 | 107 | 1 | 1 | 106 | 106 | 106 | 106 |  |  |
| Permissible interference power | *Pr* ( *p*) (dBW)in *B* | −115 | −140 | −137 |  |  | −120 | −116 | −216 | −217 | −140 |  |  |  |  |  |
|  | 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 Non-geostationary mobile-satellite service feeder links.4 Non-geostationary-satellite systems.5 Geostationary-satellite systems.6 Non-geostationary fixed-satellite service systems. |

**Regulatory procedures for Method B: Allocation to MSS (Earth-to-space) in the frequency band 25.25-25.5 GHz:**

ARTICLE 5

Frequency allocations

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

MOD UAE/48/7

24.75-29.9 GHz

|  |
| --- |
| Allocation to services |
| Region 1 | Region 2 | Region 3 |
| 25.25-25.5 FIXED INTER-SATELLITE 5.536 MOBILE MOBILE-SATELLITE (Earth-to-space) ADD 5.C110 ADD 5.D110 ADD 5E.110 Standard frequency and time signal-satellite (Earth-to-space) |

ADD UAE/48/8

5.C110 Mobile-satellite service use in the band 25.25-25.5 GHz is limited to geostationary systems exclusively. No. **9.11A** shall apply in respect of coordination with non-geostationary space stations operating in the ISS in this band.    (WRC‑15)

ADD UAE/48/9

5.D110 In the band 25.25-25.5 GHz, the minimum distance from the baseline beyond which shipborne mobile earth stations would not cause harmful interference to the fixed services operating in this band is 48 km from the low-water mark (territorial waters boundary) officially recognized by the coastal State.    (WRC‑15)

ADD UAE/48/10

5.E110 MSS earth stations operating in the band 25.25-25.5 GHz shall not cause harmful interference to the FS in this band. No. **5.43** shall not apply.    (WRC‑15)

**Reasons:** To ensure that there is no harmful interference to the current or future FS.

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 UAE/48/11

TABLE 5-1     (Rev.WRC‑12)

Technical conditions for coordination

(see Article 9)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ReferenceofArticle 9 | Case | Frequency bands(and Region) of the service for which coordinationis sought | Threshold/condition | Calculation method | Remarks |
| No. **9.7**GSO/ GSO (cont.) |  | 10) 25.25-25.5 GHz  | i) Bandwidths overlapii) Any network in the inter-satellite service (ISS) or MSS and any associated space operation functions with a GSO space station within an orbital arc of ±8° of the nominal orbital position of a proposed network in the MSS or ISS  |  | An administration may request, pursuant to No. **9.41**, to be included in requests for coordination, indicating the networks for which the value [TBD (see Note)] is attained |

APPENDIX 7 (REV.WRC‑12)

MOD UAE/48/12

TABLE 7c    (Rev.WRC‑15)

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

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Transmitting spaceradiocommunication service designation | Mobile-satellite | Fixed-satellite | Fixed-satellite 2 | Fixed-satellite 3 | Space research | Earth exploration-satellite,space research | Fixed-satellite,mobile-satellite,radionavigation-satellite | Fixed-satellite 2 |
| Frequency bands (GHz) | 25.25-25.5 | 24.65-25.2527.0-29.5 | 28.6-29.1 | 29.1-29.5 | 34.2-34.7 | 40.0-40.5 | 42.5-4747.2-50.250.4-51.4 | 47.2-50.2 |
| Receiving terrestrial service designations | Fixed, mobile,radionavigation | Fixed, mobile | Fixed, mobile | Fixed, mobile | Fixed, mobile, radiolocation | Fixed, mobile | Fixed, mobile,radionavigation | Fixed,mobile |
| Method to be used | § 2.1 | § 2.1 | § 2.2 | § 2.2 |  | § 2.1, § 2.2 | § 2.1, § 2.2 | § 2.2 |
| Modulation at terrestrial station 1 | N | N | N | N |  | N | N | N |
| Terrestrial station interference parameters and criteria | *p*0 (%) | 0.005 | 0.005 | 0.005 | 0.005 |  | 0.005 | 0.005 | 0.001 |
| *n* | 1 | 1 | 2 | 1 |  | 1 | 1 | 1 |
| *p* (%) | 0.005 | 0.005 | 0.0025 | 0.005 |  | 0.005 | 0.005 | 0.001 |
| *NL* (dB) | 0 | 0 | 0 | 0 |  | 0 | 0 | 0 |
| *Ms* (dB) | 25 | 25 | 25 | 25 |  | 25 | 25 | 25 |
| *W* (dB) | 0 | 0 | 0 | 0 |  | 0 | 0 | 0 |
| Terrestrial station parameters | *Gx* (dBi) 4 | 50 | 50 | 50 | 50 |  | 42 | 42 | 46 |
| *Te* (K) | 2 000 | 2 000 | 2 000 | 2 000 |  | 2 600 | 2 600 | 2 000 |
| Reference bandwidth | *B* (Hz) | 106 | 106 | 106 | 106 |  | 106 | 106 | 106 |
| Permissible interference power | *Pr*( *p*) (dBW)in *B* | −111 | −111 | −111 | −111 |  | −110 | −110 | −111 |
|  |  |

1 A: analogue modulation; N: digital modulation.

2 Non-geostationary satellites in the fixed-satellite service.

3 Feeder links to non-geostationary-satellite systems in the mobile-satellite service.

4 Feeder losses are not included.

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