|  |  |
| --- | --- |
| **World Radiocommunication Conference (WRC-19) Sharm el-Sheikh, Egypt, 28 October – 22 November 2019** |  |
|  |  |
|  |  |
| PLENARY MEETING | **Addendum 6 to Document 54(Add.19)-E** |
|  | **8 October 2019** |
|  | **Original: English** |
|  | |
| Samoa (Independent State of)/Singapore (Republic of) | |
| Proposals for the work of the conference | |
|  | |
| Agenda item 7(F) | |

7 to consider possible changes, and other options, in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference, an advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, in accordance with Resolution **86 (Rev.WRC-07)**, in order to facilitate rational, efficient and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit;

7(F) Issue F - Measures to facilitate entering new assignments into the RR Appendix **30B** List

Introduction

An administration who wants to convert its national allotment in RR Appendix **30B** to assignments in an economically viable manner often needs to modify the initial characteristics of its national allotments, taking into account the latest available development and advancement in technology. For this purpose, the administration will make a submission and follow the procedures of Article 6 of RR Appendix **30B**.

In so doing:

a) when the submission is examined and published by the Bureau, the submission would need to coordinate with affected networks with higher priority;

b) due to the conservative criteria used in RR Appendix **30B**, a large number of coordination requirements will be identified;

c) networks can be designed with combinations of characteristics, possibly unrealistic, to obtain a high sensitivity to interference from later submissions of other administrations.

As a result, it may be difficult for an administration to successfully complete the coordination within the regulatory period.

In response to these particular problems, and to facilitate coordination of submissions of new networks and ease access of administrations to the frequency bands of RR Appendix **30B**, Method F1 identified under this agenda item proposed changes which include:

– Adopting the structure decided by WRC-2000 for RR Appendices **30** and **30A**, i.e.a reduced coordination arc and mechanisms to remove unnecessary coordination requirements inside the coordination arc, and consequently align Annex 3 of the RR Appendix **30B** limits to newly established coordination arcs in line with that used for the unplanned frequency bands, i.e. 7° for C-band and 6° for Ku-band.

– Introducing pfd masks in Annex 4 of RR Appendix **30B** as is the case in RR Appendices **30** and **30A** and portions of the unplanned frequency bands, in order to remove unnecessary coordination and prevent combinations of technical parameters leading to unrealistic links from hindering introduction of new networks. Proposed values for pfd masks and levels are those developed for unplanned broadcasting-satellite service (BSS) frequency band 21.4-22.0 GHz in preparation for WRC-15. They are based on a level of protection corresponding to ΔT/T = 6% for C-band antennas with a diameter between 1.2 and 18 m and for Ku-band antennas with a diameter between 45 cm and 11 m.

Method F1 as represented in the CPM Report, should be updated such that the uplink conditions take into account coverage diagrams when determining the triggering uplink pfd. This was introduced and discussed at the last meeting of ITU-R Working Party 4A (Geneva, 26 June to 4 July 2019).

Samoa and Singapore support Method F1 in the CPM Report, taking into account further updates to this Method from ITU-R Working Party 4A and other regional organizations such as CEPT.

APPENDIX 30B (REV.WRC‑15)

Provisions and associated Plan for the fixed-satellite service  
in the frequency bands 4 500-4 800 MHz, 6 725-7 025 MHz,  
10.70-10.95 GHz, 11.20-11.45 GHz and 12.75-13.25 GHz

MOD SMO/SNG/54A19A6/1#50094

ANNEX 3     (Rev.WRC‑19)

Limits applicable to submissions received under Article 6 or Article 7[[1]](#footnote-1)15

Under assumed free-space propagation conditions, the power flux-density (space-to-Earth) of a proposed new allotment or assignment produced on any portion of the surface of the Earth shall not exceed:

– −131.4\* dB(W/(m2 · MHz)) in the 4 500-4 800 MHz frequency band; and

– −118\* dB(W/(m2 · MHz)) in the 10.70-10.95 GHz and 11.20-11.45 GHz frequency bands.

Under assumed free-space propagation conditions, the power flux-density (Earth-to-space) of a proposed new allotment or assignment shall not exceed:

– −140.0\*\* dB(W/(m2 · MHz)) towards any location in the geostationary-satellite orbit located more than 7° from the proposed orbital position in the 6 725-7 025 MHz frequency band, and

– −133.0\*\* dB(W/(m2 · MHz)) towards any location in the geostationary-satellite orbit located more than 6° from the proposed orbital position in the 12.75-13.25 GHz frequency band.

\*NOTE – These are consequential changes to the proposed reduction of the coordination arc from 10° to 7° in the 4 GHz frequency band and from 9° to 6° in the 10/11 GHz frequency band. Should other sizes of the coordination arc be considered by WRC‑19, the power flux-densities should be amended according to the equation: pfdnew = pfdcurrent – 25 ∙ log (current coordination arc / new coordination arc).

\*\*NOTE – Different from downlink where there is an assumption on antenna discrimination towards the GSO arc (outside the coordination arc): 32/29-25logϕ, on the uplink there is no assumption of receiving antenna discrimination towards the interfering uplink earth station (i.e. co-coverage and no geographical separation gain). Consequently, to keep the uplink interference level the same in the case the size of the coordination arc is changed, the pfd produced at the GSO arc should remain unchanged.

**Reasons:** The proposed changes will remove some unnecessary coordination and facilitate coordination of submissions of new networks and also ease access of administrations to the frequency bands of RR Appendix **30B** while assuring unchanged levels of protection of other RR Appendix **30B** satellite networks outside the coordination arc.

MOD SMO/SNG/54A19A6/2#50095

ANNEX 4     (REV.WRC‑19)

Criteria for determining whether an allotment or  
an assignment is considered to be affected

An allotment or an assignment is considered as being affected by a proposed new allotment or assignment:

1 if the orbital spacing between its orbital position and the orbital position of the proposed new allotment or assignment is equal to or less than:

1.1 7° in the 4 500-4 800 MHz (space-to-Earth) and 6 725-7 025 MHz (Earth-to-space) frequency bands;

1.2 6° in the 10.70-10.95 GHz (space-to-Earth), 11.20-11.45 GHz (space-to-Earth) and 12.75-13.25 GHz (Earth-to-space) frequency bands.

2 However, an administration is considered as not being affected if at least one of the following conditions is satisfied:

2.1 the calculated[[2]](#footnote-2)16 Earth-to-space single-entry carrier-to-interference (*C*/*I*)*u* value at each test point associated with the allotment or assignment under consideration is greater than or equal to a reference value that is 30 dB, or (*C*/*N*)*u* + 9 dB[[3]](#footnote-3)17[[4]](#footnote-4) , whichever is the lowest and the calculated16 space-to-Earth single-entry (*C*/*I*)*d* value everywhere within the service area of the allotment or assignment under consideration is greater than or equal to a reference value[[5]](#footnote-5)19 that is 26.65 dB, or (*C*/*N*)*d* + 11.65 dB[[6]](#footnote-6)20, whichever is the lowest and the calculated16 overall aggregate (*C*/*I*)*agg* value at each test point associated with the allotment or assignment under consideration, is greater than or equal to a reference value that is 21 dB, or (*C/N*)*t* + 7 dB[[7]](#footnote-7)21, or any already accepted overall aggregate (*C*/*I*)*agg* value, whichever is the lowest, with a tolerance of 0.25 dB[[8]](#footnote-8)22 in the case of assignments not stemming from the conversion of an allotment into an assignment without modification, or when the modification is within the envelope characteristics of the initial allotment;

2.2 in the 4 500-4 800 MHz (space-to-Earth) frequency band, the pfd produced under assumed free-space propagation conditions does not exceed the threshold values shown below, anywhere within the service area of the allotment or assignment under consideration:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | θ | ≤ | 0.09 | −243.5 | dB(W/(m2 ∙ Hz)) |
| 0.09 | < | θ | ≤ | 3 | −243.5 + 20log(θ/0.09) | dB(W/(m2 ∙ Hz)) |
| 3 | < | θ | ≤ | 5.5 | −219.8 + 0.75 ∙ θ2 | dB(W/(m2 ∙ Hz)) |
| 5.5 | < | θ | < | 7 | −196.8 + 25log(θ/5.6) | dB(W/(m2 ∙ Hz)) |

where θ denotes nominal geocentric separation (degrees) between interfering and interfered-with satellite networks;

in the 6 725-7 025 MHz (Earth-to-space) frequency band, the pfd produced at the location in the geostationary-satellite orbit of the allotment or assignment under consideration under assumed free‑space propagation conditions does not exceed −204.0 dB- GRx (W/(m2 ∙ Hz)) where GRx is the relative space station uplink receive antenna gain of the potentially affected assignment at the location of the interfering earth station;

in the 10.7-10.95 and 11.2-11.45 GHz (space-to-Earth) frequency bands, the pfd produced under assumed free-space propagation conditions does not exceed the threshold values shown below, anywhere within the service area of the allotment or assignment under consideration:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | θ | ≤ | 0.05 | −238.0 | dB(W/(m2 ∙ Hz)) |
| 0.05 | < | θ | ≤ | 3 | −238.0 + 20log(θ/0.05) | dB(W/(m2 ∙ Hz)) |
| 3 | < | θ | ≤ | 5 | −210.9 + 0.95 ∙ θ2 | dB(W/(m2 ∙ Hz)) |
| 5 | < | θ | < | 6 | −187.2 + 25log(θ/5) | dB(W/(m2 ∙ Hz)) |

where θ denotes nominal geocentric separation (degrees) between interfering and interfered-with satellite networks;

in the 12.75-13.25 GHz (Earth-to-space) frequency band, the pfd produced at the location in the geostationary-satellite orbit of the allotment or assignment under consideration under assumed free‑space propagation conditions does not exceed −208.0 dB- GRx (W/(m2 ∙ Hz)) where GRx is the relative space station uplink receive antenna gain of the potentially affected assignment at the location of the interfering earth station.

**Reasons:** The proposed changes will remove some unnecessary coordination and facilitate coordination of submissions of new networks and also ease access of administrations to the frequency bands of RR Appendix **30B** while assuring adequate protection of other RR Appendix **30B** satellite networks.

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

1. 15 These limits shall not apply to assignments submitted in accordance with Article 6 or recorded in the List before 23 November 2019. [↑](#footnote-ref-1)
2. 16 Including a computational precision of 0.05 dB. [↑](#footnote-ref-2)
3. 17 *C*/*Nu* is calculated as in Appendix **2** to this Annex. [↑](#footnote-ref-3)
4. 18 (SUP – WRC‑19) [↑](#footnote-ref-4)
5. 19 The reference values within the service area are interpolated from the reference values on the test points. [↑](#footnote-ref-5)
6. 20 *C*/*Nd* is calculated as in Appendix **2** to this Annex. [↑](#footnote-ref-6)
7. 21 (*C*/*N)t* is calculated as in Appendix **2** of this Annex. [↑](#footnote-ref-7)
8. 22 Inclusive of the 0.05 dB computational precision. [↑](#footnote-ref-8)