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| **42 MEETING OF PERMANENT****CONSULTATIVE COMMITTEE II:****RADIOCOMMUNICATIONS****August 28 to September 01, 2023****Ottawa, Canada** | **OEA/Ser.L/XVII.4.2.42****CCP.II-RADIO /doc. 5940/23****13 August 2023****Original: English** |
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|  | **PROPOSALS FOR THE WORK OF THE CONFERENCE AGENDA ITEM 9.2 - SCALING FACTOR** |  |
|  | **(Item on the Agenda: 3.1 (SGT-5))** |  |
|  | **(Document submitted by the delegation of the United States of America)** |  |

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| **Impact on the sector:** |
| This document supports the work of CITEL’s PCC.II Working Group for WRC under 3.1 of the agenda. |

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| **Executive Summary:** |
| Under agenda item 9.2, the United States makes the proposals below on the following section of the BR Director’s Report:* Section 3.1.8.1: PFD scaling factor in the 17.7-19.3 GHz band

The U.S. invites further discussions with other interested CITEL Member States during PCCII to consider this preliminary proposal towards development of an IAP. |

**PROPOSALS FOR THE WORK OF THE CONFERENCE**

Agenda Item 9.2

9 to consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with Article 7 of the ITU Convention;

9.2 on any difficulties or inconsistencies encountered in the application of the Radio Regulations;

**Background**

Article **21,** Section **V** of the Radio Regulations contain power flux-density (PFD) limits at the Earth’s surface produced by a space station for the protection of terrestrial services from space services. The Table **21-4** contains limits that apply to emissions by a space station of the service indicated. For the frequency band 17.7-19.3 GHz, Table **21-4** includes footnote 13 which applies a function X in No. **21.16.6,** to define the scaling function of the total number, N, of satellites in non-GSO satellite constellations.

With respect to the parameter “X” indicated in No. **21.16.6** (a.k.a. “Scaling factor”), WRC-19 decided (i) to call for studies by ITU-R of the appropriateness of the equations contained in RR No. **21.16.6** for large non-GSO satellite systems; and, (ii) to issue qualified favourable findings under RR Nos. **9.35**/**11.31** when examining compliance of frequency assignments to non-GSO FSS satellite systems with RR Article **21** pfd limits applicable in the frequency band 17.7-19.3 GHz if the notifying administration requests the Bureau to do so. To date, the Bureau received five requests whereby qualified favourable findings have been given accordingly.

In response to the call for studies, Working Party 4A has studied “the appropriateness of the equations contained in RR No. **21.16.6** for large non-GSO satellite systems (e.g. such as those having more than 1 000 satellites).” Studies conducted in WP 4A have shown that the equation in No. **21.16.6** is not appropriate for large non-GSO systems employing more than 1000 space stations. Based on results of studies, and taking into account the need to ensure the protection of terrestrial services, the United States supports modification of the equations for X in No. **21.16.6**, as shown below, for constellations above 1000 satellites, taking into account maximum number of space stations visible across all latitudes. This new parameter Nv should be calculated by the BR from orbital parameters of ITU filings, and should be published accordingly. Further, for the application of No. **21.16.6**, the full constellation shall apply, to avoid the case of separate (or split) filings.

Finally, the Bureau shall examine using the amended equations provided – those non-GSO systems that have been given a qualified favourable finding notified by those administrations that have requested the Bureau to do so based on the decision of WRC-19 related to the “Scaling Factor”.

**Proposals**:

(***USA Note***: The U.S. invites further discussions with other CITEL Member States during PCCII

#42 to finalize the scaling factor equation TBD variable highlighted below.)

**USA/9.2/1 MOD**

13 21.16.6 The function *X* is defined as a function of the number, *N*, of satellites in the non-geostationary satellite constellation in the fixed-satellite service, as follows:

 $X=0$ dB for      *N*  ≤ 50

 $X=\frac{5}{119}\left(N-50\right)$ dB for  50 < *N* ≤ 288

 $X=\frac{1}{69}\left(N+402\right)$ dB for       288 < N <= 1000

X = Max[20.3, 10 × log10(*Nv*)] dB for 5000 >= N > 1000

X = (10 \* log10(Nv)) +[TBD]) dB for N > 5000

 Where *Nv* is the maximum number of visible space stations – considering a minimum elevation angle equal to 0 degrees – from any location on the surface of the Earth and within the service area of the non-GSO system. ***Nv*** does not depend on latitude; it encompasses the maximum number of visible satellites across all latitudes within the service area of the relevant non-GSO system.

In the band 18.8-19.3 GHz, these limits apply to emissions of any space station in a non-geostationary-satellite system in the fixed-satellite service for which complete coordination or notification information, as appropriate, has been received by the Radiocommunication Bureau after 17 November 1995, and which was not operational by that date. (WRC-2023)

Reason: Modification of No. **21.16.6** to fix the equation to calculate X as the result of the call for studies by WRC-19.