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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 1 to Document 142(Add.25)-E** | |
|  | | **29 October 2023** | |
|  | | **Original: English** | |
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| United States of America | | | |
| Proposals for the work of the conference | | | |
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| 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;[[1]](#footnote-1)1 and

Background

Article **21**,Section**V** of the Radio Regulations (RR) 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. RR 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, RR Table **21-4** includes footnote 13 which applies a function X in RR No. **21.16.6,** to define the scaling function of the total number, *N*, of satellites in non-geostationary-satellite orbit (non-GSO) satellite constellations.

With respect to the parameter “X” indicated in RR 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 fixed-satellite service (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 (WP) 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 RR No. **21.16.6** is not appropriate for large non-GSO systems employing more than 1 000 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 RR No. **21.16.6**, as shown below, for constellations above 1 000 satellites, taking into account the 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 RR 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”.

ARTICLE 21

Terrestrial and space services sharing frequency bands above 1 GHz

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

MOD USA/142A25A1/1

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:

 dB for       *N*  ≤ 50

 dB for  50 < *N* ≤ 288

 dB for      *N* > 288

*X* = Max[20.3, 10 × log10(*N*v)] dB for 5 000 > = *N* > 1 000

*X* = (10 \* log10(*N*v)) +[3]) dB for      *N* > 5 000

Where *N*v 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. *N***v** 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‑23)

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

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1. 1 This agenda sub-item is strictly limited to the Report of the Director on any difficulties or inconsistencies encountered in the application of the Radio Regulations and the comments from administrations. Administrations are invited to inform the Director of the Radiocommunication Bureau of any difficulties or inconsistencies encountered in the Radio Regulations. [↑](#footnote-ref-1)