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| A close up of a sign  Description automatically generated | **World Radiocommunication Conference (WRC-23) Dubai, 20 November - 15 December 2023** | | Logo, company name  Description automatically generated |
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|  | | **Doc. CPG(23)060 ANNEX V-22J** | |
| PLENARY MEETING | | **Addendum 12 to Document XXXX(Add.22)-E** | |
|  | | **18 April 2023** | |
|  | | **Original: English** | |
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| European Common Proposals | | | |
| Proposals for the work of the conference | | | |
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| Agenda item 7(J) | | | |

7 to consider possible changes, in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference, on 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 the rational, efficient and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit;

7(J) Topic J - Modifications to Resolution **76 (Rev.WRC-15)**

Introduction

No. **22.5C** of the Radio Regulations contains epfd limits for non-GSO satellite systems for the protection of GSO satellite networks in the Ku- and Ka-bands. These are “per-system” limits and are based on the aggregate epfd limits stipulated in Resolution **76 (Rev. WRC-15)** applicable via No. **22.5K**. It should also be noted that No. **22.5CA** allows that the single-entry limits can be exceeded on the territory of any country whose administration has so agreed.

Resolution **76 (Rev.WRC-15)** considers that the aggregate epfd limits should not be exceeded and *resolves* that administrations must take all necessary steps, including modifications to their systems, if necessary, to ensure that aggregate interference into GSO fixed-satellite service (GSO FSS) and GSO broadcasting-satellite service (BSS) networks caused by such systems operating co-frequency does not cause the aggregate power levels to be exceeded. If aggregate levels are exceeded, then administrations operating non-GSO FSS systems must take all necessary measures to expeditiously decrease aggregate interference levels to those in Tables 1A to 1D of Resolution **76 (Rev.WRC-15)**, or to higher levels where those levels are acceptable to the affected GSO administration.

While noting Recommendation ITU-R S.1588, “Methodologies for calculating aggregate downlink equivalent power flux-density produced by multiple non-geostationary fixed-satellite service systems into a geostationary fixed-satellite service network”, the Resolution invites ITU-R to continue studies to develop a suitable methodology to calculate the aggregate epfd levels produced by non-GSO FSS systems; to develop one Recommendation on the accurate modelling of interference and another one containing procedures to be used by administrations to ensure that aggregate epfd levels not exceeded, and to develop measurement techniques to identify non-GSO FSS systems in excess of the aggregate limits.

Resolution **76 (Rev.WRC-15)** calls for collaboration among administrations to jointly ensure those levels are not exceeded. However, there is neither methodology nor procedures outlined in Resolution **76 (Rev.WRC-15)** in place for the involved administrations to collaboratively determine whether these aggregate levels are exceeded. This Topic J aims to address a part of this deficiency by introducing the concept of establishing a consultation meeting process to be applied to non-GSO fixed-satellite service (FSS) systems operators to avoid and remedy any exceedance of the aggregate interference levels in Tables 1A to 1D of the Resolution **76 (Rev.WRC-15)** based on accurate modelling of non-GSO systems.

In relation to this, it is recognized that methods and technical procedures are under development in the ITU-R towards establishing one or more new Recommendations to be used during the consultations that would include, for example:

* A methodology for calculating the aggregate epfd produced by non-GSO FSS systems operating or planning to operate co-frequency in the frequency bands referred to in Resolution **76 (Rev.WRC-15)**;
* A methodology to correct any exceedance of the aggregate epfd limits by all those operational non-GSO FSS systems that would meet the criteria in any potential revision of Resolution **76 (Rev.WRC-15)** or one or more ITU-R Recommendations, as appropriate.

Some important details, such as the precise indication of which non-GSO FSS systems operating or planning to operate are considered in the various steps of consideration, or precise availability of information in support of calculations, are expected to be reflected in the above-mentioned methodologies being developed in Recommendations. Such details may not be addressed in the modification of the Resolution **76 (Rev.WRC-15)** itself but in the above-mentioned methodologies. The ultimate correction of any exceedance of the aggregate epfd limits, if necessary, should focus on non-GSO systems in operation and should use a methodology that avoids any implementation challenges as much as possible.

Notwithstanding the above, CEPT is of the view that, in order to ensure that consultation meetings are effective, considering the amount of resources required by notifying administrations, their satellite operators and the Bureau to hold them, they should preferably occur when the abovementioned methodologies are adopted and approved by the ITU-R.

CEPT is also of the view that, in order to improve the effectiveness of the application of No. **22.5K** of the Radio Regulations, Resolution **76 (Rev.WRC-15)** should be amended to provide guidance on an appropriate process (including Terms of Reference) to ensure that those administrations responsible for the non-geostationary-satellite systems in the fixed-satellite service comply with *resolves* 2 of Resolution **76 (Rev.WRC-15)**.

Based on the above, it is proposed to:

* modify Resolution **76 (Rev.WRC-15)**;
* add Annex 2 to Resolution **76 (Rev.WRC-15)** containing the Terms of Reference that should be used by concerned administrations for consultation meetings in case one or more administrations responsible for the non-geostationary-satellite systems in the fixed-satellite service need to comply with *resolves* 2 of Resolution **76 (Rev.WRC-15)**.

Proposals

MOD EUR/XXXA22A12/1

RESOLUTION 76 (REV.WRC-23)

Protection of geostationary fixed-satellite service and geostationary broadcasting-satellite service networks from the maximum aggregate   
equivalent power flux‑density produced by multiple non‑geostationary   
fixed-satellite service systems in frequency bands where equivalent  
power flux-density limits have been adopted

The World Radiocommunication Conference (Dubai, 2023),

considering

*a)* that WRC‑97 adopted, in Article **22**, provisional equivalent power flux-density (epfd) limits to be met by non‑geostationary fixed-satellite service (non-GSO FSS) systems in order to protect GSO FSS and GSO broadcasting-satellite service (BSS) networks in parts of the frequency range 10.7-30 GHz;

*b)* that WRC‑2000 revised Article **22** to ensure the limits contained therein provide adequate protection to GSO systems without placing undue constraints on any of the systems and services sharing these frequency bands;

*c)* that WRC‑2000 decided that a combination of single-entry validation, single-entry operational and, for certain antenna sizes, single-entry additional operational epfd limits, contained in Article **22**, along with the aggregate limits in Tables 1A to 1D as contained in Annex 1 to this Resolution, which apply to non‑GSO FSS systems, protects GSO networks in these frequency bands;

*d)* that these single-entry validation limits have been derived from aggregate epfd masks contained in Tables 1A to 1D of Annex 1, assuming a maximum effective number of non-GSO FSS systems of 3.5;

*e)* that the aggregate interference caused by all co-frequency non‑GSO FSS systems in these frequency bands into GSO FSS systems should not exceed the aggregate epfd limits in Tables 1A to 1D of Annex 1;

*f)* that to achieve the objective in *considering e)*, administrations operating non-GSO FSS systems would need to establish in collaboration, through consultation meetings, the evaluation of aggregate interference levels of all concerned space stations and the implementation of measures to ensure that the emission of those non-GSO FSS space stations do not exceed the aggregate epfd limits required for the protection of GSO FSS networks;

*g)* that WRC‑97 decided, and WRC‑2000 confirmed, that non‑GSO FSS systems in the frequency bands in question are to mutually coordinate the use of frequencies in these frequency bands under the provisions of No. **9.12**;

*h)* that the orbital characteristics of such systems are likely to be inhomogeneous;

*i)* that, as a result of this likely inhomogeneity, the aggregate epfd levels from multiple non‑GSO FSS systems will not be directly related to the actual number of systems sharing a frequency band;

*j)* that the possible misapplication of single-entry limits should be avoided,

recognizing

*a)* that non-GSO FSS systems may need to implement interference mitigation techniques to mutually share frequencies;

*b)* that, notwithstanding *considering d)* and *e)*, there may be instances where the aggregate interference from non‑GSO systems could exceed the interference levels given in Tables 1A to 1D of Annex 1;

*c)* that administrations operating GSO networks may wish to ensure that the aggregate epfd produced by all operating co-frequency non‑GSO FSS systems in the frequency bands referred to in *considering a)* above into GSO FSS and/or GSO BSS networks does not exceed the aggregate interference levels given in Tables 1A to 1D of Annex 1;

*d)* that there is no suitable methodology for calculating the aggregate epfd produced by non‑GSO FSS systems operating co-frequency in the frequency bands referred to in considering a) above into GSO FSS and GSO BSS networks;

*e)* that there is no existing methodology to adapt the operation of all non-GSO FSS systems operating co-frequency in the frequency bands referred to in *considering a)* above to ensure that the aggregate epfd limits given in Tables 1A to 1D of Annex 1 are met;

*f*) that exceedance of the aggregate interference levels given in Tables 1A to 1D of Annex 1 may occur before the methodologies mentioned *in recognizing d)* and *e)* above are made available to the membership and that, in such a case, the provisions included in No. **22.5K** of the Radio Regulations apply;

*g)* that the single-entry limits may be exceeded on the territory of any country whose administration has so agreed (see No. **22.5CA**),

noting

that Recommendation ITU‑R S.1588 provides methodologies for calculating aggregate downlink equivalent power flux-density produced by multiple non-geostationary fixed-satellite service systems into a geostationary fixed-satellite service network,

resolves

1 that administrations operating or planning to operate non‑GSO FSS systems, for which coordination or notification information, as appropriate, was received after 21 November 1997, in the frequency bands referred to in *considering a)* above, individually or in collaboration, shall take all possible steps, including, if necessary, by means of appropriate modifications to their systems, to ensure that the aggregate interference into GSO FSS and GSO BSS networks caused by such systems operating co-frequency in these frequency bands does not cause the aggregate power levels given in Tables 1A to 1D of Annex 1 to be exceeded (see No. **22.5K**);

2 that, in the event that the aggregate interference levels in Tables 1A to 1D of Annex 1 are exceeded, administrations operating non‑GSO FSS systems in these frequency bands shall take all necessary measures expeditiously to reduce the aggregate epfd levels to the limits given in Tables 1A to 1D of Annex 1, or to higher levels where those levels are acceptable to the affected GSO administration (see No. **22.5K**);

3 that, since the limits of Tables 1A to 1D of Annex 1 were based on the assumption that 3.5 non-GSO FSS systems would operate simultaneously, once there are at least 4 non-GSO systems[[1]](#footnote-1) operating co-frequency in at least one of the frequency bands indicated in Tables 1A to 1D of Annex 1, the concerned administrations participating in this process of epfd calculation shall hold consultation meetings as needed, but not earlier than when the methodologies mentioned in *invites the ITU Radiocommunication Sector* 1 and 2 are approved and made available to the membership;

4 that consultation meetings shall start either once the methodologies in *invites* *the ITU Radiocommunication Sector* 1 and 2 are available or after 01 June 2027 whichever comes first,

5 that those administrations participating in the consultation meeting shall designate one administration that shall communicate to the Bureau the results of any technical or operational amendment to the relevant non-GSO FSS systems following the application of *resolves* 2 above;

6 that any amendment to the relevant non-GSO FSS systems mentioned in *resolves* 5 above shall not affect the regulatory status of the affected non-GSO systems, including following any modifications to their published characteristics;

7 in case it is identified that the limits of Tables 1A to 1D of Annex 1 are exceeded before the methodologies mentioned in *invites the ITU Radiocommunication Sector* 1 and 2 are approved and made available to the membership, the Terms of Reference included in Annex 2 shall be used by the relevant administrations in application of the provisions included in No. **22.5K** of the Radio Regulations,

invites the ITU Radiocommunication Sector

1 to continue as a matter of urgency its studies and to develop, as appropriate, a suitable methodology for calculating the aggregate epfd produced by the deployed satellites of all non‑GSO FSS systems, which may be used to determine whether the systems are in compliance with the aggregate power levels given in Tables 1A to 1D of Annex 1, taking into account relevant elements of Recommendation ITU-R S.1588 and Recommendation ITU-R S.1503, as appropriate;

2 to develop, as a matter of urgency, a suitable methodology to adapt the operation of the deployed satellites of all non-GSO FSS systems operating co-frequency in the frequency bands referred to in *considering a)* above to ensure that the aggregate power levels given in Tables 1A to 1D of Annex 1 are met;

3 to continue to verify, as a matter of urgency, the effectiveness of the procedures defined in Resolution **76 (Rev.WRC-23)** and, if needed, study and analyze possible amendments to those procedures in Resolution **76 (Rev.WRC-23)**,

instructs the Radiocommunication Bureau

1 to participate in consultation meetings mentioned under *resolves* 3 to 5 and to observe carefully the results of the epfd calculation mentioned in *resolves* 3;

2 to publish in the International Frequency Information Circular (BR IFIC) the information referred to in *resolves* 5 and *instructs the Radiocommunication Bureau* 1;

3 to report to WRC-27 on the development of the methodologies mentioned in *invites the ITU Radiocommunication Sector* 1 and 2.

ANNEX 1 TO RESOLUTION 76 (REV.WRC-23)

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ANNEX 2 TO RESOLUTION 76 (REV.WRC-23)

Terms of Reference regulating the process that shall be used by the relevant administrations in application of the provisions included in No. **22.5K** of the Radio Regulations (including any Consultation Meeting) in application of *resolves* 3 and 4.

1 Relevant Meetings between administrations operating non‑GSO systems in the fixed-satellite service (FSS) in the frequency bands indicated in Tables 1A to 1D of Annex 1 in application of No. **22.5K** of the Radio Regulations will be held in accordance with this Resolution. These meetings will ensure that, in the event that the aggregate interference levels in Tables 1A to 1D of Annex 1 are exceeded, those exceedances will be corrected.

2 For each meeting, a convening administration is appointed.

3 In application of No. **22.5K** of the Radio Regulations, the administrations of the participating non-GSO systems shall work together to ensure that the relative exceedance with respect to the limits in Tables 1A to 1D in Annex 1, or relative to any other higher levels if there is an agreement of such levels under *resolves* 2, is removed after the consultation meeting noting that it may take up to 30 days for the non-GSO system to implement the required changes to relevant parameters;

1. The number of non-GSO systems needs to take into account the fact that some systems are using multiple filings which may be notified by more than one notifying administration [↑](#footnote-ref-1)