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| **40 MEETING OF PERMANENT**  **CONSULTATIVE COMMITTEE II:**  **RADIOCOMMUNICATIONS**  **October 31 to November 04, 2022**  **Port of Spain, Trinidad and Tobago** | | **OEA/Ser.L/XVII.4.2.39**  **CCP.II-RADIO /doc. /22**  **6 October 2022**  **Original: English** |
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|  | **DRAFT PROPOSALS FOR THE WORK OF THE CONFERENCE**  **AGENDA ITEM 1.19** | |
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|  | **(Item on the Agenda: 3.1)**  **(Document submitted by the United States of America)** | |

**Impact on the sector:**

This document supports the CITEL PCCII WRC Working Group’s preparations for WRC-23.

**Executive Summary:**

This document contains a preliminary proposal from the United States for WRC-23 agenda item 1.19.

**UNITED STATES OF AMERICA**

**DRAFT PROPOSALS FOR THE WORK OF THE CONFERENCE**

**Agenda Item 1.19** *to consider a primary allocation to the fixed-satellite service (FSS) in the space-to-Earth direction in the frequency band 17.3-17.7 GHz in Region 2, while ensuring the protection of existing primary services in the band, recognizing the need of preserving and protecting the frequencies subject to the application of Appendix 30A, in accordance with Resolution* ***174 (WRC-19)****.*

**Background Information**:

This agenda item addresses the consideration of a new primary allocation for the Fixed-Satellite Service (FSS) in the space-to-Earth direction in the 17.3-17.7 GHz frequency band for Region 2.

In Region 2, the 17.3-17.7 GHz frequency band is allocated to the unplanned broadcasting-satellite service (BSS, by definition, a downlink) and the FSS in the Earth-to-space direction limited to BSS feeder links operating under Appendix **30A** (AP**30A**). An FSS downlink allocation is technologically similar to the operations of the existing BSS allocation, which currently is subject to coordination under No. **9.7** using a coordination trigger defined in Appendix **5.** For ground path interference, where a transmitting feeder link earth station may cause interference with nearby receiving FSS earth stations, sharing procedures exists through the application of site coordination under Article **6** of Appendix **30A** using the coordination area determined by Appendix **7**.

For NGSO FSS operations in this band, the protection of the BSS and the AP30A is ensured by extending the provisions of Article **22** by adding the Region 2 FSS (space-to-Earth) allocation in the frequency band 17.3-17.7 GHz to Table 22-1Bfor the application of epfd↓ and to Table 22-3 for the application of epfdis,respectively. Sharing between FSS NGSOs are assured by extending the application of No. **9.12** (NGSO-NGSO coordination) to 17.3-17.7 GHz (space-to-Earth) in Region 2:

**Proposals**:

**MOD** USA/AI 1.19/1

TABLE 5-1     (Rev.WRC‑23)

**Technical conditions for coordination**

(see Article **9**)

ARTICLE 5

**Frequency allocations**

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

**15.4-18.4 GHz**

|  |  |  |
| --- | --- | --- |
| **Allocation to services** | | |
| **Region 1** | **Region 2** | **Region 3** |
| **17.3-17.7**  FIXED-SATELLITE (Earth-to-space) 5.516 (space-to-Earth) 5.516A 5.516B  Radiolocation | **17.3-17.7**  FIXED-SATELLITE (Earth-to-space) MOD 5.484A 5.516 MOD (space-to-Earth) MOD 5.516A MOD 5.517  BROADCASTING-SATELLITE  Radiolocation | **17.3-17.7**  FIXED-SATELLITE (Earth-to-space) 5.516  Radiolocation |
| 5.514 | 5.514 5.515 | 5.514 |

**Reasons:** Introduce the FSS (space-to-Earth) allocation in the frequency band 17.3-17.7 GHz in Region 2 and apply RR Nos. **5.516A** and **5.517** to this new allocation. Also, new footnotes for application of NGSO satellite systems are introduced.

**MOD** USA/AI 1.19/2

**5.484A**  The use of the bands 10.95-11.2 GHz (space-to-Earth), 11.45-11.7 GHz (space-to-Earth), 11.7-12.2 GHz (space-to-Earth) in Region 2, 12.2-12.75 GHz (space-to-Earth) in Region 3, 12.5-12.75 GHz (space-to-Earth) in Region 1, 13.75-14.5 GHz (Earth-to-space), 17.3-17.7 GHz (space-to-Earth) in Region 2, 17.8-18.6 GHz (space-to-Earth), 19.7-20.2 GHz (space-to-Earth), 27.5-28.6 GHz (Earth-to-space), 29.5-30 GHz (Earth-to-space) by a non-geostationary-satellite system in the fixed-satellite service is subject to application of the provisions of No. **9.12** for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the fixed-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and No. **5.43A** does not apply. Non-geostationary satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated.

**Reasons:** Extend No. **9.12** to apply to the frequency band 17.3-17.7 GHz in Region 2

**MOD** USA/AI 1.19/3

**5.516A** In the band 17.3-17.7 GHz, earth stations of the fixed-satellite service (space-to-Earth) in Regions 1 and 2 shall not claim protection from the broadcasting-satellite service feeder-link earth stations operating under Appendix **30A**, nor put any limitations or restrictions on the locations of the broadcasting-satellite service feeder-link earth stations anywhere within the service area of the feeder link.     (WRC-23)

**Reasons:** Extend the applicability of these footnote to Region 2 and RR Table 22-3 covering the frequency range 17.8-18.4 GHz, could be extended in Region 2, to 17.3-18.4 GHz.

**MOD** USA/AI 1.19/4

**5.517** In Region 2, use of the fixed-satellite (space-to-Earth) service in the band 17.3-17.8 GHz shall not cause harmful interference nor claim protection from assignments in the broadcasting-satellite service operating in conformity with the Radio Regulations.     (WRC--23)

**Reasons:** Extend the applicability of the frequency ranges in this footnote to Region 2.

**MOD** USA/AI 1.19/7

ARTICLE 22

**Space services**1

…

TABLE **22-1B**     (WRC‑23)

**Limits to the epfd**↓ **radiated by non‑geostationary-satellite systems  
in the fixed-satellite service in certain frequency bands**3, 6, [[1]](#footnote-2)8, X

| **Frequency band (GHz)** | **epfd**↓ **(dB(W/m2))** | **Percentage of time during which epfd**↓ **may not be exceeded** | **Reference bandwidth (kHz)** | **Reference antenna diameter and reference radiation pattern**7 |
| --- | --- | --- | --- | --- |
| 17.8-18.6 | −175.4  −175.4  −172.5  −167  −164  −164 | 0  90  99  99.714  99.971  100 | 40 | 1 m Recommendation ITU‑R S.1428-1 |
| −161.4  −161.4  −158.5  −153  −150  −150 | 0  90  99  99.714  99.971  100 | 1 000 |
|  | −178.4  −178.4  −171.4  −170.5  −166  −164  −164 | 0  99.4  99.9  99.913  99.971  99.977  100 | 40 | 2 m Recommendation ITU‑R S.1428-1 |
| −164.4  −164.4  −157.4  −156.5  −152  −150  −150 | 0  99.4  99.9  99.913  99.971  99.977  100 | 1 000 |
|  | −185.4  −185.4  −180  −180  −172  −164  −164 | 0  99.8  99.8  99.943  99.943  99.998  100 | 40 | 5 m Recommendation ITU‑R S.1428-1 |
| −171.4  −171.4  −166  −166  −158  −150  −150 | 0  99.8  99.8  99.943  99.943  99.998  100 | 1 000 |

**Reasons:** Applies epfd↓ limits in order to Protect GSO BSS (space-to-Earth) allocation from NGSO FSS (space-to-Earth) operations.

**MOD** USA/AI 1.19/8

TABLE **22-3**     (WRC‑2023)

**Limits to the epfdis radiated by non-geostationary-satellite systems in the fixed-  
satellite service in certain frequency bands**[[2]](#footnote-3)19

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Frequency band (GHz)** | **epfdis (dB(W/m2))** | **Percentage of time during which epfdis level may not be exceeded** | **Reference bandwidth (kHz)** | **Reference antenna beamwidth and reference radiation pattern**[[3]](#footnote-4)20 |
| 10.7-11.7  (Region 1)  12.5-12.75  (Region 1)  12.7-12.75  (Region 2) | −160 | 100 | 40 | 4° Recommendation ITU‑R S.672-4, *Ls* = −20 |
| 17.3-17.7  (space-to-Earth)  (Region 2)  17.8-18.4 | −160 | 100 | 40 | 4° Recommendation ITU‑R S.672-4, *Ls* = −20 |

**Reasons:** Applies epfdis limits in order to protect FSS (earth-to-space) feeder links subject to AP30A from NGSO FSS.

**MOD** USA/AI 1.19/9

APPENDIX 30A (REV.WRC‑19)[[4]](#footnote-5)\*

**Provisions and associated Plans and List**[[5]](#footnote-6)1 **for feeder links for the broadcasting-satellite service (11.7-12.5 GHz in Region 1, 12.2-12.7 GHz  
in Region 2 and 11.7-12.2 GHz in Region 3) in the frequency bands  
14.5-14.8 GHz**[[6]](#footnote-7)2 **and 17.3-18.1 GHz in Regions 1 and 3,  
and 17.3-17.8 GHz in Region 2**     (WRC‑03)

ARTICLE 7     (Rev.WRC‑23)

**Coordination, notification and recording in the Master International   
Frequency Register of frequency assignments to stations in the fixed-satellite service (space-to-Earth) in Regions 1 and 2 in the frequency band 17.3-18.1 GHz and in Region 3 in the frequency band 17.7-18.1 GHz, to stations in the fixed‑satellite service (Earth-to-space) in Region 2 in the frequency bands 14.5‑14.8 GHz and 17.8‑18.1 GHz, to stations in the fixed-satellite service (Earth-to-space) in countries listed in Resolution 163 (WRC**‑**15) in the frequency band 14.5‑14.75 GHz and in countries listed in Resolution 164 (WRC**‑**15) in the frequency band 14.5-14.8 GHz where those stations are not for feeder links for the broadcasting-satellite service, and to stations in the broadcasting-satellite service in Region 2 in the frequency band 17.3-17.8 GHz when frequency assignments to feeder links for broadcasting-satellite stations in the frequency bands 14.5-14.8 GHz and 17.3-18.1 GHz in Regions 1 and 3 or in the   
frequency band 17.3-17.8 GHz in Region 2 are involved**[[7]](#footnote-8)28     (Rev.WRC‑23)

**Section I – Coordination of transmitting space or earth stations in the fixed-satellite   
service or transmitting space stations in the broadcasting-satellite service  
with assignments to broadcasting-satellite service feeder links**

**Reasons:** Applies epfd↓ limits in order to Ppotect GSO BSS (space-to-Earth) allocation from NGSO FSS (space-to-Earth) operations.

**MOD** USA/AI 1.19/10

7.1 The provisions of No. **9.7**[[8]](#footnote-9)29 and the associated provisions under Articles **9** and **11** are applicable to transmitting space stations in the fixed-satellite service in Regions 1 and 2 in the frequency band 17.3-18.1 GHz, to transmitting space stations in the fixed-satellite service in Region3 in the frequency band 17.7-18.1 GHz, to transmitting earth stations in the fixed-satellite service in Region 2 in the frequency bands 14.5-14.8 GHz and 17.8‑18.1 GHz, to transmitting earth stations in the fixed-satellite service in countries listed in Resolution **163 (WRC‑15)** in the frequency band 14.5-14.75 GHz and in countries listed in Resolution **164 (WRC‑15)** in the frequency band 14.5-14.8 GHz where those stations are not for feeder links for the broadcasting-satellite service, and to transmitting space stations in the broadcasting-satellite service in Region 2 in the frequency band 17.3-17.8 GHz.     (WRC‑-23)

**Reasons:** Extend the applicability of the provisions in RR Appendix **30A**, Article **7,** 7.1, to the FSS (space-to-Earth) in the 17.3-17.7 GHz band in Region 2.

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**Reasons:** Consequential

**MOD** USA/AI 1.19/11

ANNEX 4     (Rev.WRC‑19)

**Criteria for sharing between services**

**1 Threshold values for determining when coordination is required between, on one hand, transmitting space stations in the fixed-satellite service or the broadcasting-satellite service and, on the other hand, a receiving space station in the feeder-link Plan or List or a proposed new or modified receiving space station in the List, in the frequency bands 17.3-18.1 GHz (Regions 1 and 3) and in the feeder-link Plan or a proposed modification to the Plan in the frequency band 17.3‑17.8 GHz (Region 2)**     (WRC‑03)

With respect to § 7.1, Article 7, coordination of a transmitting geostationary space station in the fixed-satellite service or in the broadcasting-satellite service with a receiving space station in a broadcasting-satellite service feeder link in the Regions 1 and 3 feeder-link Plan or List, or a proposed new or modified receiving space station in the List, or in the Region 2 feeder-link Plan or proposed modification to the Plan is required when the power flux-density arriving at the receiving space station of a broadcasting-satellite service feeder link of another administration would cause an increase in the noise temperature of the feeder-link space station which exceeds a threshold value of Δ*Ts* / *Ts* corresponding to 6%. Δ*Ts* / *Ts* is calculated in accordance with Case II of the method given in Appendix **8**.

In Region 2, with respect to § 7.1, Article 7, a transmitting non-geostationary system in the fixed-satellite service with respect to a receiving space station in the broadcasting-satellite feeder link in the Region 2 feeder-link Plan or proposed modification to the Plan shall meet the equivalent power flux-density limit in table 22-3 of Article 22. (WRC-23)

Reasons: Consequential based on Table 22-3 updates for epfdisto protect AP30A

**MOD** USA/AI 1.19/11

APPENDIX 5 (REV.WRC-23)

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TABLE 5-1 (*continued*)     (Rev.WRC‑23)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Reference of Article 9** | **Case** | **Frequency bands (and Region) of the service for which coordination is sought** | **Threshold/condition** | **Calculation  method** | **Remarks** |
| No. **9.7** GSO/GSO (*cont.*) |  | 2*bis*) 13.4-13.65 GHz (Region 1) | i) Bandwidth overlap, and  ii) any network in the space research service (SRS) or any network in the FSS and any associated space operation functions (see No. **1.23**) with a space station within an orbital arc of ±6° of the nominal orbital position of a proposed network in the FSS or SRS |  |  |
|  | 3) 17.7‑19.7 GHz, (Regions 3),  17.3-19.7 GHz  (Region 1 and 2) and 27.5‑29.5 GHz | i) Bandwidth overlap, and  ii) any network in the FSS and any associated space operation functions (see No. **1.23**) with a space station within an orbital arc of ±8° of the nominal orbital position of a proposed network in the FSS |  |  |
|  | 3*bis*)19.7-20.2 GHz and 29.5-30 GHz | i) Bandwidth overlap, and  ii) any network in the FSS or in the mobile-satellite service (MSS) and any associated space operation functions (see No. **1.23**) with a space station within an orbital arc of ±8° of the nominal orbital position of a proposed network in the FSS or in the MSS. |  |  |
|  |  |  |  |  |

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| **Reasons:** Consequential, Covers the coordination of two GSO networks of the FSS (except earth stations operating in opposite directions of transmission) under No. **9.7**.  **SUP** USA/AI 1.19/12  RESOLUTION 174 (WRC 19)  Primary allocation to the fixed-satellite service in the space-to-Earth direction  in the frequency band 17.3-17.7 GHz in Region 2  **Reasons:** Consequential action as studies are completed.  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |

1. 8 **22.5C.7** A non-geostationary-satellite system shall meet the limits of this Table in both the 40 kHz and the 1 MHz reference bandwidths.     (WRC‑2000)

   X 22.5C.X A non-geostationary-satellite system shall meet the limits of this Table for the 17.3-17.7 GHz band with respect to satellite systems in the broadcasting-satellite service utilizing the reference patterns of Recommendation ITU-R BO.1443. (WRC-2023). [↑](#footnote-ref-2)
2. 19 **22.5F.2** In meeting these limits, the administrations intending to develop such systems shall ensure that the assignments appearing in the feeder-link Plans of Appendix **30A** will be fully protected.      (WRC‑2023) [↑](#footnote-ref-3)
3. 20 **22.5F.3** In this Table, the reference pattern of Recommendation ITU‑R S.672-4 shall be used only for the calculation of interference from non-geostationary-satellite systems in the fixed-satellite service into geostationary-satellite systems in the fixed-satellite service. In applying the equations of Annex 1 to Recommendation ITU‑R S.672-4, the parabolic main beam equation shall start at zero.     (WRC‑2000) [↑](#footnote-ref-4)
4. \* The expression “frequency assignment to a space station”, wherever it appears in this Appendix, shall be understood to refer to a frequency assignment associated with a given orbital position.     (WRC‑03) [↑](#footnote-ref-5)
5. 1 The Regions 1 and 3 feeder-link List of additional uses is annexed to the Master International Frequency Register (see Resolution **542 (WRC‑2000**)\*\*).     (WRC‑03)

   \*\* *Note by the Secretariat*: This Resolution was abrogated by WRC‑03. [↑](#footnote-ref-6)
6. 2 This use of the band 14.5-14.8 GHz is reserved for countries outside Europe.

   *Note by the Secretariat*: Reference to an Article with the number in roman is referring to an Article in this Appendix. [↑](#footnote-ref-7)
7. 28 These provisions do not replace the procedures prescribed in Articles **9** and **11** when stations other than those for feeder links in the broadcasting-satellite service subject to a Plan are involved.     (WRC‑03) [↑](#footnote-ref-8)
8. 29 (SUP – WRC-19) [↑](#footnote-ref-9)