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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 19 to Document 44-E** | |
|  | | **26 June 2023** | |
|  | | **Original: English** | |
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| Member States of the Inter-American Telecommunication Commission (CITEL) | | | |
| Proposals for the work of the conference | | | |
|  | | | |
| Agenda item 1.19 | | | |

1.19to consider a new 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, while protecting existing primary services in the band, in accordance with Resolution **174 (WRC‑19)**;

**Background**

In the World Radiocommunication Conference 2019, Resolution **174 (WRC-19)** was established to consider a new 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.

In Region 2, this frequency band is allocated on a primary basis to the unplanned broadcasting-satellite service (BSS) and to the FSS in the Earth-to-space direction, limited to the BSS feeder links operating in accordance with Appendix **30A**.

An FSS (space-to-Earth) emission is similar to a BSS (space-to-Earth) emission. Both consist of a space station transmitting a signal towards the Earth that will be received by fixed earth station terminals. In principle, the interference scenario with respect to other services should not be different, however, with this new allocation, the flexibility in possible uses of the band would be increased.

In Region 1, the band is already allocated to the FSS, a new allocation in Region 2 progresses the principle of Regional harmonization, which allows for synchronization of frequency bands across both Regions.

During the 52nd meeting of Working Party 4A of the International Telecommunication Union, held from 14 to 22 September 2022, in response to the provisions of Resolution **174 (WRC-23)**, it was possible to carry out and complete in time at least 9 sharing studies for the frequency band 17.3-17.7 GHz, between the fixed-satellite service (space-to-Earth) and the broadcasting-satellite service (space-to-Earth), as well as the fixed-satellite service (space-to-Earth) and the fixed-satellite service (Earth-to-space). It is noteworthy that the sharing studies presented deal with downlink operations (space-to-Earth) for the fixed-satellite service with geostationary satellite systems (GSO), and the fixed-satellite service with non-geostationary satellite systems (Non-GSO).

Likewise, 4 studies were presented with different compatibility scenarios in which the primary allocations for the lower adjacent band comprised between 17.2-17.3 GHz are considered. In addition, with respect to the upper adjacent band comprised of 17.7-17 .8 GHz, 8 studies were carried out with different compatibility scenarios for services allocated on a primary basis.

As a result of the studies, various modifications to provisions of the Radio Regulations (RR) were considered in order to consider the different operating scenarios for the fixed-satellite service (space-to-Earth) for both geostationary and non-geostationary satellites.

As a result of the sharing studies, the draft of the Report for the Conference Preparatory Meeting (CPM) for agenda item 1.19 was prepared, in which two methods of attention were proposed in this regard. However, derived from the second session of the Conference Preparatory Meeting for WRC-23 (CPM23-2), two additional methods were added to satisfy this agenda item. The regulatory and procedural considerations of Method B of the CITEL IAC were entirely transferred to Method D in the CPM Report. The resulting methods are as follows:

– Method A proposes no change to the RR and suppression of Resolution **174 (WRC-19)**;

– Method B proposes modifications to the RR in order to allocate the frequency band 17.3-17.7 GHz in Region 2 to the FSS in the space-to-Earth direction This method contains two alternatives for several items to provide a wide range of options. The selection of Alternative 1 for all the items extends provisions used in Region 1 to Region 2, as well as the addition of other provisions, while the selection of Alternative 2 for all items results in more conservative conditions with the objective to provide further protection of the BSS feeder link AP30A receiving space station and GSO FSS systems;

– Method C proposes modifications to the RR in order to allocate the frequency band 17.3-17.7 GHz in Region 2 to the FSS in the space-to-Earth direction, limiting the FSS operation to geostationary satellites;

and

– Method D proposes modifications to the RR in order to allocate the frequency band 17.3-17.7 GHz in Region 2 to the FSS in the space-to-Earth direction, extending the regulatory provisions used in Region 1 to Region 2, as well as the addition of other provisions.

**Proposals**

ARTICLE 5

Frequency allocations

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

MOD IAP/44A19/1#1953

5.484AThe 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.     (WRC‑23)

**Reasons:** The applicability of RR No. **5.484A** in Region 2 is considered for considerations of non-geostationary satellite systems in the fixed-satellite service.

MOD IAP/44A19/2#1921

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) MOD 5.516A 5.516B  Radiolocation | 17.3-17.7  FIXED-SATELLITE (Earth-to-space) 5.516 (space-to-Earth) MOD 5.484A 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 No. **5.516A** to this new allocation.

MOD IAP/44A19/3#1943

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:** The possibility of a primary FSS (space-to-Earth) allocation in Region 2 would provide satellite operators the flexibility to satisfy BSS or FSS service demand in the same frequency band indistinctly.

MOD IAP/44A19/4#1945

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

**Reasons:** The extension of applicability of No. **5.517** addresses the addition of the direction (space-to-Earth) of the fixed-satellite service in the frequency band 17.3-17.7 GHz, at the same time it seeks to protect assignments to the broadcasting-satellite service in Region 2.

ARTICLE 22

Space services1

Section II − Control of interference to geostationary-satellite systems

MOD IAP/44A19/5#1926

TABLE **22-1B**     (WRC‑23)

Limits to the epfd↓ radiated by non‑geostationary-satellite systems  
in the fixed-satellite service in certain frequency bands3, 6, 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 pattern7 |
| --- | --- | --- | --- | --- |
| 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 |

ADD IAP/44A19/6#1929

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X 22.5C.X In Region 2, a non-geostationary-satellite system in the fixed-satellite service shall meet the limits of this table for the 17.3-17.7 GHz band with respect to geostationary-satellite systems in the broadcasting-satellite service and shall utilize the reference patterns of Recommendation ITU‑R BO.1443‑3.     (WRC‑23)

**Reasons:** When operating in Region 2, the non-geostationary-satellite systems of the fixed-satellite service must at all times respect the limits of Article **22** towards the assignments of geostationary-satellite systems of the broadcasting-satellite service. Makes mandatory to use Rec. ITU-R BO.1443-3 which is already incorporated by reference.

MOD IAP/44A19/7#1930

TABLE **22-3**     (WRC‑23)

Limits to the epfdis radiated by non-geostationary-satellite systems in the fixed-  
satellite service in certain frequency bands19, Y

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 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 pattern20 |
| 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 |
| 17.8-18.4 | −160 | 100 | 40 | 4° Recommendation ITU‑R S.672-4, *Ls* = −20 |

ADD IAP/44A19/8#1931

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Y 22.5F.Y In Region 2, a non-geostationary-satellite system in the fixed-satellite service shall meet the limits of this table for the frequency band 17.3-17.7 GHz with respect to a receiving space station in the fixed-satellite service of Appendix 30A.     (WRC‑23)

**Reasons:** When operating in Region 2, non-geostationary-satellite systems of the fixed-satellite service must at all times respect the limits imposed in Article **22** towards the assignments of receiving geostationary-satellite systems under Appendix **30A**. Because FSS operates in both space-to-Earth and Earth-to-space directions, it is important to clarify which particular services are being referred.

APPENDIX 30A (REV.WRC‑19)[[1]](#footnote-1)\*

Provisions and associated Plans and List[[2]](#footnote-2)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[[3]](#footnote-3)2 and 17.3-18.1 GHz in Regions 1 and 3,  
and 17.3-17.8 GHz in Region 2     (WRC‑03)

MOD IAP/44A19/9#1934

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 involved28     (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

MOD IAP/44A19/10#1935

7.1 The provisions of No. 9.7[[4]](#footnote-4)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 Region 3 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, to the FSS (space-to-Earth) in the 17.3-17.7 GHz band in Region 2.

APPENDIX 5 (REV.WRC‑19)

Identification of administrations with which coordination is to be effected or  
agreement sought under the provisions of Article 9

MOD IAP/44A19/11#1939

TABLE 5-1     (Rev.WRC‑23)

Technical conditions for coordination

(see Article 9)

…

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 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, (Region 3),  17.3-19.7 GHz  (Regions 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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SUP IAP/44A19/12#1920

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.

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1. \* 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-1)
2. 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-2)
3. 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-3)
4. 29 (SUP – WRC-19) [↑](#footnote-ref-4)