|  |  |  |
| --- | --- | --- |
|  | ASIA-PACIFIC TELECOMMUNITY | Document No: |
| **The 2nd Meeting of the APT Conference Preparatory Group for WRC-23 (APG23-2)** | **APG23-2/INF-31**  **(Rev.1)** |
| 19 – 23 April 2021, Virtual/Online Meeting | 19 April 2021 |

Chairman, DG on AI 1.17

**brief on wrc-23 agenda item 1.17**

(Note: *This brief was developed for information purpose only. It does not necessarily express the view of APG-23*)

**Agenda Item 1.17:**

*to determine and carry out, on the basis of the ITU-R studies in accordance with Resolution 773 (WRC 19), the appropriate regulatory actions for the provision of inter-satellite links in specific frequency bands, or portions thereof, by adding an inter-satellite service allocation where appropriate*

**Relevant Resolutions and Responsible/Contributing ITU-R Groups**

|  |  |
| --- | --- |
| ***Topic*** | ***Actions to be taken by the group*** |
| Resolution **773 (WRC-19)** Study of technical and operational issues, and regulatory provisions for satellite-to-satellite links in the frequency bands 11.7-12.7 GHz, 18.1- 18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz | *resolves to invite ITU‑R*  1 to develop the technical and operational characteristics of different types of space stations that plan satellite-to-satellite transmissions in the frequency bands 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz, taking into account considering e) above;  2 to study the technical and operational characteristics, including spectrum requirements, off axis e.i.r.p. values and out-of-band emission limits, for transmissions between space stations in the frequency bands 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz;  3 to study sharing and compatibility between satellite-to-satellite links, intending to operate between space stations in the frequency bands 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz, and current and planned stations of the FSS and other existing services allocated in same frequency bands and adjacent bands, including passive services, with a view to ensuring protection of the primary services in recognizing further i);  4 to develop, for different types of space stations, the technical conditions and regulatory provisions for satellite-to-satellite operations in the frequency bands 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz, or portions thereof, including new ISS allocations, as appropriate, taking into account the results of the studies above,  *invites administrations*  to participate in the studies and to provide input contributions,  resolves to invite the 2023 World Radiocommunication Conference  to consider the results of the above studies and take necessary regulatory actions, as appropriate.  *invites the 2023 World Radiocommunication Conference*  to consider the results of the above studies and take necessary regulatory actions, as appropriate. |
|  |  |
| ***Responsible Group*** | ***Contributing Group*** |
| **WP4A** | **WP 3M, WP 4B, WP 4C, WP 5A, WP 5B, WP 5C, WP 7B** |

# General

## 1. Background Information

* At WRC-19, the agenda was proposed by CEPT [Addendum 24 to Document 16-E (WRC-19)](https://www.itu.int/dms_pub/itu-r/md/16/wrc19/c/R16-WRC19-C-0016!A24!MSW-A.docx) and CITEL [Addendum 16 to Document 11(Add.24)-E (WRC-19)](https://www.itu.int/dms_pub/itu-r/md/16/wrc19/c/R16-WRC19-C-0011!A24-A16!MSW-E.docx)
* WP 4A is assigned as the responsible group of this agenda item to carry out study of technical and operational issues, and regulatory provisions for satellite-to-satellite links in the frequency bands 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz as follows:
* to develop the technical and operational characteristics of different types of space stations that plan satellite-to-satellite transmissions in the frequency bands 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz
* to study the technical and operational characteristics, including spectrum requirements, off‑axis e.i.r.p. values and out-of-band emission limits, for transmissions between space stations in the frequency bands 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz
* to study sharing and compatibility between satellite-to-satellite links, intending to operate between space stations in the frequency bands 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8‑20.2 GHz and 27.5‑30 GHz, and current and planned stations of the FSS and other existing services allocated in same frequency bands and adjacent bands, including passive services, with a view to ensuring protection of the primary services
* to develop, for different types of space stations, the technical conditions and regulatory provisions for satellite-to-satellite operations in the frequency bands 11.7‑12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz, or portions thereof, including new ISS allocations, as appropriate

## 2. Information on on-going ITU-R Study

* Latest WP 4A document (Virtual Meeting from 22 February to 3 March 2021)
* Working document on WRC-23 Agenda item 1.17 [(Annex 21 to Working Party 4A Chairman’s Report)](https://www.itu.int/dms_ties/itu-r/md/19/wp4a/c/R19-WP4A-C-0246!N21!MSW-E.docx)
* Preliminary draft CPM text for WRC-23 Agenda item [(Annex 26 to Working Party 4A Chairman’s Report)](https://www.itu.int/CookieAuth.dll?GetLogon?curl=Z2Fdms_tiesZ2Fitu-rZ2FmdZ2F19Z2Fwp4aZ2FcZ2FR19-WP4A-C-0246Z21N26Z21MSW-E.docx&reason=0&formdir=10)
* Work plan for WRC-23 Agenda item 1.17 [(Annex 33 to Working Party 4A Chairman’s Report)](https://www.itu.int/CookieAuth.dll?GetLogon?curl=Z2Fdms_tiesZ2Fitu-rZ2FmdZ2F19Z2Fwp4aZ2FcZ2FR19-WP4A-C-0246Z21N33Z21MSW-E.docx&reason=0&formdir=10)
* Ongoing discussion in WP-4A meetings:
* Satellite-to-satellite technical characteristics and operational parameters for sat-to-sat links
* Characteristics of space and terrestrial frequency assignments to be used in sharing and compatibility studies
* Off-axis EIRP of satellite-to-satellite links
* Out-of-band and spurious emissions of satellite-to-satellite links
* Sharing and compatibility between satellite-to-satellite links intending to operate between space stations in the frequency bands 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz and current and planned stations of the FSS
* Identification areas for which information from Working Parties contributing to the studies under this agenda item may be necessary and draft possible liaison statements to such Working Parties, as appropriate and if needed
* etc.
* Correspondence Group on WRC-23 agenda item 1.17 (CG#3) will work by electronic means in the period between the virtual meeting of WP 4A in February/March 2021 and the next scheduled virtual meeting of WP 4A in July 2021 to advance the work on WRC-23 agenda item 1.17.
  + - * Terms of reference for WP 4A Correspondence Group on WRC-23 agenda item 1.17 and the specific areas of focus are summarized in Annex 34 to the Chairman’s Report [(Annex 34 to Working Party 4A Chairman’s Report)](https://www.itu.int/CookieAuth.dll?GetLogon?curl=Z2Fdms_tiesZ2Fitu-rZ2FmdZ2F19Z2Fwp4aZ2FcZ2FR19-WP4A-C-0246Z21N34Z21MSW-E.docx&reason=0&formdir=10)
      * Chairman of the CG#3 Mr Samuel Blondeau (Luxembourg)
      * Correspondence Group dates: 4 March 2021 – 23 June 2021

## 3. Position of the Regional Group (if available)

3.1 ATU

* Not available.

3.2 ASMG (as of March 2021)

* Follow up studies
* The inter satellite link should not:

1. impose any restrictions on the GSO and NGSO satellites

2. impose any restrictions on existing services

* The studies should be done on real registered NGSO constellation
* The transmission between two satellites will have the same protection levels for GSO, NGSO satellites and existing services as been stipulated in the Radio Regulations

Reference: [Arab Spectrum Management Group (ASMG) 27th ASMG Meeting](https://www.itu.int/dms_pub/itu-r/oth/0A/0A/R0A0A0000170001PDFE.pdf)

3.3 CEPT (as of December 2020)

* Non‐GSO user space stations should comply with applicable EPFD limits in the portions of the Ku‐ and Ka bands where these limits apply when communicating with a non‐GSO FSS service provider space station
* The higher altitude to lower altitude link transmissions in 11.7‐12.7 GHz, 18.1‐18.6 GHz and 18.8‐20.2 GHz from the GSO or non‐GSO FSS service provider space

station to the non‐GSO user space station would be identical in technical

characteristic to the transmissions from GSO or non‐GSO service providers to any ground‐based user in the service provider’s network

* CEPT proposes that space stations that plan satellite‐to‐satellite transmissions

should be governed by the following preliminary guiding principles:

* Only operations within the cone of coverage of GSO or NGSO service provider space stations are allowed. The cone of coverage of an FSS service provider space station is the volume of space between the service provider space station and its notified service areas. For the operation of non‐GSO service provider space stations, the cone of coverage moves and changes as the satellite moves around its orbit
* Satellite‐to‐satellite link transmissions will comply with the same directionality indicators as in the existing FSS allocations (Earth‐to‐space = from lower altitude to higher altitude, space‐to‐Earth = from higher altitude to lower altitude)
* Non‐GSO user space stations will operate in a manner that should resemble typical user stations of the host FSS service provider system
* Non‐GSO user space stations should comply with applicable EPFD limits in the portions of the Ku‐ and Ka bands where these limits apply when communicating with a non‐GSO FSS service provider space station
* The higher altitude to lower altitude link transmissions in 11.7‐12.7 GHz, 18.1‐18.6 GHz and 18.8‐20.2 GHz from the GSO or non‐GSO FSS service provider space station to the non‐GSO user space station would be identical in technical characteristic to the transmissions from GSO or non‐GSO service providers to any ground‐based user in the service provider’s network

Reference: [Status of CEPT Preparation for WRC-23 / RA-23](https://cept.org/files/4200/2021-01-14%20Status%20of%20CEPT%20prepararation%20for%20WRC-23%20(December%202020).pdf), December 2020

3.4 CITEL (as of December 2020)

* Some administrations support studies under the terms of Resolution 773 (WRC-19) to consider appropriate regulatory actions for the provision of satellite-to-satellite links in the FSS in the frequency bands 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz, and 27.5-30 GHz

Reference: [36 Meeting of PCC.II, 30 November to 4 December](https://cept.org/Documents/cpg/61939/cpg-20-info-26_citels-preparation-for-world-radiocommunication-conferences), 2020

3.5 RCC (as of September 2020)

* The RCC Administrations consider that the use of inter-satellite links in the frequency bands 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz, and 27.5-30 GHz may impose severe constraints on the use of the existing and future systems/networks of FSS, inter alia, over the national territories.
* The RCC Administrations support the studies of technical and operational characteristics, including spectrum requirements, off-axis e.i.r.p. values and out-of-band emission limits, for inter-satellite links in the frequency bands 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz.
* The RCC Administrations support the sharing and compatibility studies between inter-satellite links in the frequency bands 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz, and existing and future stations of the FSS and other existing services allocated in same frequency bands and adjacent bands, including passive services, with a view to ensuring protection of the primary services. The results of these ITU-R studies should be agreed by Member States by consensus.
* The RCC Administrations consider that technical conditions and regulatory provisions should be developed for different types of space stations for satellite-to-satellite operations in the frequency bands 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz, or portions thereof, including new ISS allocations, as appropriate, taking into account the results of the studies above.

Reference: [Preliminary Position of the RCC Administrations on Agenda Items of the World Radiocommunication Conference 2023](https://www.itu.int/oth/R0A0200000B/en), 4 September 2020

## 4. Position of International Organizations (if available)

* + 1. ICAO (as of November 2020)
* To ensure that any radio regulatory action taken as a result of this agenda item does not adversely affect the provision of UAS CNPC under Resolution 155 (Rev. WRC-19)

Reference: Draft ICAO Position for ITU WRC-23 [(Document 5B/191-E)](https://www.itu.int/md/R19-WP5B-C-0191/en)

4.2 IMO

* Not available.

4.3 WMO (2020)

* None.

4.4 IARU

* Not available.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_