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| **The 4th Meeting of the APT Conference Preparatory Group for WRC-23 (APG23-4)** | **APG23-4/INP-xx** |
| 15 – 20 August 2022, Bangkok, Thailand | xx August 2022 |

Thailand (Kingdom of)

**preliminary views on WRC-23 agenda items 1.15 1.17 AND 7**

**Agenda Item 1.15:**

*to harmonize the use of the frequency band 12.75-13.25 GHz (Earth-to-space) by earth stations on aircraft and vessels communicating with geostationary space stations in the fixed-satellite service globally, in accordance with Resolution* ***172 (WRC-​19)****.*

**1. Background**

The ITU has addressed aeronautical and maritime earth stations operating with GSO FSS satellites in Study Group 4 and at several WRCs that adopted technical and regulatory regimes to allow such operations. In the Radio Regulations, Resolution **902 (WRC-03)** and Resolution **169 (WRC-19)** define technical and regulatory rules to allow GSO FSS networks to communicate with earth stations on aircraft or vessels to provide broadband communications.

In addition, Resolution **172 (WRC-19)** calls for studies to ensure that AP30B allotments and assignments as well as other allocated services are protected.

**2. Preliminary Views**

Thailand supports ITU-R studies currently carried out in accordance with Resolution **172 (WRC-19)**, including the development of a regulatory framework, appropriate technical requirements, and the responsibilities of the notifying administration of the satellite network pertaining to the operation of earth stations on aircraft and vessels communicating with geostationary space stations in the fixed-satellite service in the frequency band 12.75-13.25 GHz (Earth-to-space). Such operation shall take into account the protection of existing services as well as their future developments in the same frequency band and adjacent frequency bands.

**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.*

**1. Background**

Under this agenda item, Resolution **773 (WRC-19)** invites the ITU-R:

* 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 equivalent isotropically radiated power (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 in the FSS and other existing services allocated in the same frequency bands and adjacent frequency bands, including passive services, with a view to ensuring protection of the primary services referred to above;
* 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.

**2. Preliminary Views**

Thailand supports ITU-R studies currently carried out in accordance with Resolution **773 (WRC-19)**. The development of technical conditions and regulatory provisions for the use of 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 shall ensure the protection of existing primary services as well as their future developments in the same frequency bands and in adjacent frequency bands.

Thailand is of the view that:

* any allocation for satellite-to-satellite transmissions in these frequency bands, or portions thereof, should be within the existing fixed-satellite service (FSS); and
* the epfd produced at the geostationary orbit from all combined operations of space-to-space and typical Earth station transmissions of co-frequency non-GSO FSS systems should comply with the applicable limits contained in the Article **22** of the Radio Regulations.

**Agenda Item 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;*

**1. Background**

* In the implementation of Resolution **86 (Rev. Marrakesh, 2002)**, WRC-23 is invited by Resolution **86 (Rev. WRC-07)** to consider, under the standing Agenda Item 7, any proposals which deal with deficiencies and improvements in the Regulatory/Procedural matters for frequency assignments pertaining to space service, ensuring these procedures, and the related Appendices of the Radio Regulations support latest technologies and regulatory practices, as far as possible.
* At the February/March 2021 meeting of WP 4A the ITU-R *responsible* group for this agenda item,an understanding was established that some of the items presented need not be discussed further in WP 4A, others should be further pursued under the more traditional work of WP 4A, others require further discussion before deciding on their ultimate direction, and yet others could be agreed as a “Topic” under WRC-23 Agenda item 7 for further development.

The twelve agreed Topics under WRC-23 Agenda item 7 are as follows:

Topic A: Tolerances for certain orbital characteristics of non-GSO space stations

Topic B: Post milestone reporting

Topic C: Protection of GSO MSS from non-GSO emissions in 7/8 & 20/30 GHz

Topic D: D1 Modifications to Appendix 1 to Annex 4 of RR Appendix 30B

 D2 New Appendix 4 parameters for Recommendation S.1503 update

 D3 BR reminders for BIU/BBIU

Topic E: Improved procedures under RR Appendix 30B for new ITU Member States

Topic F: Excluding uplink service areas in Appendix 30A (Regions 1& 3) and Appendix 30B

Topic G: Amendments to Resolution **770 (WRC-19)**

Topic H: Implicit agreement in Appendices 30/30A/30B

Topic I: Special agreements under RR Appendix 30B

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

Topic K: Modifications to Resolution **553 (Rev. WRC-15)**

Topic L: TT&C for NGSO in-orbit servicing

Thailand’s preliminary views on Topics A, D1 and J are as follows:

**Topic A - Tolerances for certain orbital characteristics of non-GSO space stations in the FSS, BSS, and MSS**

**Background**

WRC-19 invited the ITU-R to study “as a matter of urgency, tolerances for certain orbital characteristics of non-GSO space stations of the fixed-satellite, mobile-satellite or broadcasting satellite services to account for potential differences between the notified and deployed orbital characteristics for the inclination of the orbital plane, the altitude of the apogee of the space station, the altitude of the perigee of the space station and the argument of the perigee of the orbital plane.”

**Preliminary Views**

Thailand supports the development of the definition of tolerances for certain orbital characteristics of non-GSO space stations in the fixed-satellite service (FSS), broadcasting satellite service (BSS) and mobile-satellite service (MSS). To consider potential differences between the notified and deployed orbital characteristics and to ensure no significant change in interference environment made by a non‑GSO system, the ITU-R study shall take into account the orbital characteristics of the inclination of the orbital plane, the altitude of the apogee, the altitude of the perigee and the argument of the perigee of the orbital plane.

[Thailand is of the view that the development of appropriate regulatory consequences and necessary transitional measures after WRC-23 should be considered, given that the deployed orbital characteristics exceed the to-be-defined orbital tolerances.]

**Topic D1 - Modifications to Appendix 1 to Annex 4 of Appendix 30B**

**Background**

WRC-19 adopted modifications to § 1.1 and § 1.2 of Annex 4 of RR Appendix**30B** by replacing 10 and 9 degrees as the minimum orbital separation by 7 and 6 degrees, respectively. However, these modifications were not reflected in § 2 of Appendix 1 to Annex 4 of RR Appendix **30B** where 10 and 9 degrees are still referred to for the calculation of the aggregate *C/I* ratio at any given downlink test point.

WRC-23 Agenda item 7, Topic D, considers this discrepancy and a method as outlined in a single method and regulatory and procedural consideration has been developed, which is to modify § 2 of Appendix 1 to Annex 4 of RR Appendix **30B** toalign the values of orbital separation with those in § 1.1 and § 1.2 of the Annex adopted by WRC-19.

**Preliminary Views**

Thailand supports the single method to modify § 2 of Appendix 1 to Annex 4 of Appendix 30B of the Radio Regulations to reflect the values of the minimal orbital separation as adopted by WRC-19 in § 1.1 and §1.2 of Annex 4 of RR Appendix 30B.

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

**Background**

Resolution **76 (Rev.WRC-15)** calls for the development of a Recommendation on procedures for reducing the aggregate epfd levels and calls for negotiations among administrations to jointly reduce such levels. While the aggregate epfd limits are specified in Tables 1A to 1D of the Resolution, there is no clear regulatory framework nor procedures outlined for the involved administrations to collaboratively determine whether these aggregate levels are exceeded.

**Preliminary Views**

Thailand supports ITU-R studies on the possible modification of Resolution **76** **(Rev.WRC-15)** in order to introduce the consultation process in connection with the aggregate epfd limits of non-GSO FSS systems in Tables 1A to 1D.

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