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| APTlogogreen3 | ASIA-PACIFIC TELECOMMUNITY | **Document:**  |
| **The 3rd Meeting of the APT Conference Preparatory Group for WRC-19 (APG19-3)** | **APG19-3/OUT-16** |
| 12 - 16 March 2018, Perth, Australia | **15 March 2018** |

Working Party 3

**PRELIMINARY VIEWs on WRC-19 agenda item 9.1 Issue 9.1.3**

**Agenda item 9.1 - Issue 9.1.3:**

*to study technical and operational issues and regulatory provisions for new* *non-geostationary-satellite orbit systems in the 3 700-4 200 MHz, 4 500-4 800 MHz, 5 925-6 425 MHz and 6 725-7 025 MHz frequency bands allocated to the fixed-satellite service, in accordance with Resolution* ***157 (WRC-15)****.*

**1. Background**

WRC-19 agenda item 9.1, issue 9.1.3, in accordance with Resolution **157 (WRC-15)**, invites ITU-R to study technical and operational issues and regulatory provisions for new circular-orbit non-geostationary-satellite orbit (non-GSO) systems in the 3 700-4 200 MHz, 4 500-4 800 MHz, 5 925-6 425 MHz, and 6 725-7 025 MHz frequency bands allocated to the fixed-satellite service (FSS), while ensuring protection of existing services.

Article **21** of the Radio Regulations contains provisions to ensure compatibility of non-GSO FSS operations with the fixed and mobile services. These provisions are in the form of pfd limits for non-GSO FSS systems. Similar to the sharing situations that led to the RR Article **22** epfd limits to protect GSO systems, the existing RR Article **21** pfd limits for 3 700-4 200 MHz frequency band were established based solely on sharing studies between HEO non-GSO systems and the fixed and mobile services. New non-GSO systems that seek to operate in these frequency bands may utilize different types of orbits.

Article **22** of the Radio Regulations contains provisions to ensure compatibility of non-GSOFSS operations with GSO networks. Among these provisions are uplink and downlink equivalent power flux density (epfd↑ and epfd↓) limits to protect GSO networks from unacceptable interference. Regulatory provisions in RR Article **22** for sharing between non-GSO FSS systems and GSO FSS networks operating in the 6/4 GHz frequency bands were based on a particular type of non-GSO system using highly-elliptical orbits (HEO). The epfd↓ limits in the 3 700-4 200 MHz (space-to-Earth) and epfd↑ limits in the 5 925-6 725 MHz (Earth-to-space) frequency bands did not take into account circular-orbit non-GSO and therefore are more stringent than in other FSS bands that did consider circular orbit non-GSO systems.

RR Article 22 does not contain epfd↓ and epfd↑ limits for non-GSO systems in the frequency bands 4 500-4 800 MHz (space-to-Earth) and 6 725-7 025 MHz (Earth-to-space) allocated to the FSS, the use of which is subject to the provisions of RR Appendix 30B.

Working Party 4A (WP 4A) has been identified as the responsible ITU-R group for the studies on WRC-15 Agenda item 9.1, issue 9.1.3. Until its latest WP4A meeting in February/March 2018, following documents were developed:

* Working document towards a preliminary draft new Report ITU-R S.[NGSO\_6/4-GHz] (Annex 20 to document 4A/675) which address technical and regulatory studies for 6/4 GHz non-GSO FSS sharing;
* Working document towards a preliminary draft new Report ITU-R S.[NGSO FSS 6/4 GHz SHARING] (Annex 16 to document 4A/364) which address sharing between non-GSO systems in the FSS and existing and planned systems in the terrestrial and space services allocated on a primary basis in the frequency bands 3 700-4 200 MHz, 4 500-4 800 MHz, 5 925-6 425 MHz and 6 725-7 025 MHz;
* Working document towards draft CPM text for WRC-19 agenda item 9.1, issue 9.1.3 (Annex 50 to document 4A/675)*.*

To address this issue, three studies were indicated as conclusion in working document towards draft CPM text for WRC-19 agenda item 9.1 issue 9.1.3. One study indicated that there is no need to review the values of the existing limits presented in Article **22** epfd and Article **21** pfd of the Radio Regulations for the 3 700 4 200 MHz, 4 500-4 800 MHz, 5 925-6 425 MHz, and 6 725-7 025 MHz frequency bands. Another study suggested to envisage the establishment of aggregate epfd limits that would be verified through multilateral meetings. One more study suggested to establish coordination procedure in the frequency bands 3 700−4 200 MHz and 5 925−6 425 MHz between non-GSO FSS systems under RR No. **9.12**, while keeping the values of the existing limits presented in Article **22** epfd and Article **21** pfd of the Radio Regulations no change.

**2. Documents**

* Input Documents: APG19-3/INP-19 (INS), APG19-3/INP-23 Rev.1 (KOR), APG19-3/INP-43 (AUS), APG19-3/INP-51 (J), APG19-3/INP-61 Rev.1 (THA) , APG19-3/INP-84 Rev.1 (VTN), APG19-3/INP-88 (CHN)
* Information Documents: APG19-3/INF-06 (CEPT), APG19-3/INF-08 Rev.1 (CITEL)

**3. Summary of discussions**

**3.1 Summary of APT Members’ views**

**3.1.1 Indonesia (Republic of)** - **Document APG19-3/INP-19**

Based on ITU study that indicates that circular-orbit non-GSO FSS operations in the 6/4 GHz band could result in large exceedances of the GSO protection criteria, Indonesia is of the view that there is no need to review the values of the existing limits presented in Article **22** epfd and Article **21** pfd of the Radio Regulations for the 3 700‑4 200 MHz, 4 500-4 800 MHz, 5 925-6 425 MHz, and 6 725-7 025 MHz frequency bands.

**3.1.2** **Korea (Rep. of)** - **Document APG19-3/INP-23 Rev.1**

The Administration of Korea supports no change of the values of the existing limits presented in Article **22** epfd and Article **21** pfd of the Radio Regulations in the 3 700 4 200 MHz, 4 500-4 800 MHz, 5 925-6 425 MHz, and 6 725-7 025 MHz frequency bands, taking into account the latest ITU-R studies that it would be very difficult to operate a non-GSO circular-orbit system for the purposes of a global broadband network in the 6/4 GHz frequency bands while protecting the existing GSO systems.

**3.1.3 Australia**- **Document APG19-3/INP-43**

Australia notes that ITU-R studies of technical and operational issues and regulatory provisions for possible new non-geostationary-satellite orbit systems in the frequency bands 3 700-4 200 MHz, 4 500-4 800 MHz, 5 925-6 425 MHz and 6 725-7 025 MHz are indicating a conclusion supporting No Change to the Radio Regulations.

The draft CPM Report text Conclusion states (Document 4A/519 Annex 47):

One study indicates that circular-orbit non-GSO FSS operations in the 6/4 GHz band could result in large exceedances of the GSO protection criteria and conclude that it would be very difficult to operate a non-GSO circular-orbit system for the purposes of a global broadband network in the 6/4 GHz frequency bands. Therefore, there is no need to review the values of the existing limits presented in Article **22** epfd and Article **21** pfd of the Radio Regulations for the 3 700‑4 200 MHz, 4 500-4 800 MHz, 5 925-6 425 MHz, and 6 725-7 025 MHz frequency bands.\*

\* Studies as described in Resolution **157 (WRC-15)**.

Taking the above into consideration, and subject to outcomes of any new studies, Australia is of the view that No Change to the Radio Regulations appears an appropriate conclusion to be recommended to the Director of the ITU Radiocommunication Bureau for inclusion in his report to WRC-19 on this Issue.

**3.1.4 Japan**- **Document APG19-3/INP-51**

Japan is of the view that it is necessary for ITU-R to conduct adequate studies so that the existing services in the frequency bands 3 700-4 200 MHz, 4 500-4 800 MHz, 5 925-6 425 MHz and 6 725-7 025 MHz are not affected.

**3.1.5 Thailand**- **Document APG19-3/INP-61 Rev.1**

Thailand supports ITU-R studies of technical and operational issues and regulatory provisions for the new non-geostationary-satellite orbit systems in the 3 700-4 200 MHz, 4 500-4 800 MHz, 5 925-6 425 MHz and 6 725 7 025 MHz frequency bands allocated to the fixed-satellite service. Also, the new non-geostationary-satellite systems shall not cause any harmful interference to nor claim protection from geostationary satellite networks in fixed satellite services.

**3.1.6 Socialist Republic of Viet Nam** - **Document APG19-3/INP-84 Rev.1**

Viet Nam is of the view that:

* Supports ITU-R studies of technical and operational issues and regulatory provisions for the new non-geostationary-satellite orbit systems in the 3 700-4 200 MHz, 4 500-4 800 MHz, 5 925-6 425 MHz and 6 725 7 025 MHz frequency bands allocated to the fixed-satellite service.
* The new non-geostationary-satellite systems shall not cause any harmful interference to nor claim protection from geostationary satellite networks in fixed satellite services.

**3.1.7 China (People’s Republic of)** - **Document APG19-3/INP-88**

China supports the study of technical and operational issues and regulatory provisions for new non-GSO systems in the 3 700-4 200 MHz, 4 500-4 800 MHz, 5 925-6 425 MHz and 6 725-7 025 MHz frequency bands under the terms of Resolution **157** (WRC-15).

Based on current results of ITU-R studies, China is the preliminary view that there is no need to modify the values of the existing limits presented in Article **22** epfd and Article **21** pfd of the Radio Regulations for the 3 700 4 200 MHz, 4 500-4 800 MHz, 5 925-6 425 MHz, and 6 725-7 025 MHz frequency bands to ensure the protection of incumbent service.

**3.2 Summary of issues raised during the meeting**

Three issues were raised in this meeting as follows:

* The necessity to review current values of the existing limits presented in Article 22 epfd and Article 21 pfd of the Radio Regulations.
* The necessity to establish aggregate epfd limits that would be verified through multilateral meetings.
* The necessity to establish coordination procedure in the frequency bands 3 700-4 200 MHz and 5 925-6 425 MHz between non-GSO FSS systems under RR No. **9.12**.

After discussion, it was agreed that no change (NOC) to the Radio Regulations is the most appropriate option to address agenda item 9.1, issue 9.1.3.

**4. APT Preliminary View(s)**

APT Members support no change (NOC) to the Radio Regulations to satisfy agenda item 9.1, issue 9.1.3 based on study progress of ITU-R for new non-GSO systems in the 3 700-4 200 MHz, 4 500-4 800 MHz, 5 925-6 425 MHz and 6 725-7 025 MHz frequency bands under the terms of Resolution **157 (WRC-15)**.

**5. Other View(s)**

None.

**6. Issues for Consideration at Next APG Meeting**

APT Members are invited to follow the progress of ITU-R studies, particularly the planned WP4A meeting on 3-14 July 2018, and are encouraged to submit their contributions in the next APG meeting, if necessary.

**7. Views from Other Organisations**

**7.1 Regional Groups**

**7.1.1 ASMG** - **Document APG19-2/INF-01**

ASMG position:

* Protection of assignments and allotments of Appendix 30B and not to impose any restrictions for further deployment or current recordings.
* Not supporting the modification of the epfd spectrum density previously assigned to protect fixed satellite service systems in these bands.
* Not to support the designation of different epfd values in radio regulations, to be considered to the extent of ITU recommendations regarding coordination procedures between GSO and NGSO.
* Follow up existing studies related to this issue.
* Invite concerned working groups in ASMG to follow-up this issue in order to ensure the protection of fixed services, especially in adjacent bands.

**7.1.2 ATU** - **Document APG19-2/INF-07**

No preliminary position on this agenda item yet.

**7.1.3 CEPT** - **Document APG19-3/INF-06**

Preliminary CEPT position:

* CEPT supports the study of technical and operational issues and regulatory provisions for new non-geostationary-satellite orbit systems in the 3 700-4 200 MHz, 4 500-4 800 MHz, 5 925-6 425 MHz and 6 725-7 025 MHz frequency bands under the terms of Resolution **157 (WRC-15)**.
* CEPT supports the protection of GSO/non-GSO FSS, mobile and fixed services under these studies. No additional constrains should be applied to existing and future GSO and non-GSO FSS networks in the frequency bands 3 700-4 200 MHz (space-to-Earth) and 5 925-6 725 MHz (Earth-to-space). Furthermore, no additional constraint should apply to terrestrial services.
* CEPT is of the view that when considering the Article **22** epfd↓ limits and epfd↑ limits applicable to non-GSO systems in the frequency bands 3 700-4 200 MHz (space-to-Earth), 5 925-6 425 MHz (Earth-to-space), 4 500-4 800 MHz (space-to-Earth) and 6 725-7 025 MHz (Earth-to-space) it is necessary to ensure the protection of GSO FSS networks from unacceptable interference pursuant to No **22.2** as applicable, including the allotments of the Plan and assignments in the Appendix **30B** List.
* CEPT is of the view that studies should take into account that the protection of mobile service is ensured regardless of allocation status of the mobile service.
* In the radio frequency band 3 700-4 200 MHz (space-to-Earth) CEPT does not object to a possible revision of Table **21-4** of Article **21** for non-GSO FSS satellites, while ensuring the protection of the mobile service and fixed service, and maintaining the existing Article **21** pfd limits for GSO networks.
* When developing technical and operational conditions and regulatory provisions for new systems of non-GSO FSS, there is a need to ensure protection of existing terrestrial services in the frequency bands 4 500-4 800 MHz (space-to-Earth), 5 925-6 425 MHz (Earth-to-space) and 6 725-7 075 MHz (Earth-to-space).
	+ 1. **CITEL** - **Document APG19-3/INF-08 Rev.1**

Inter‐America Proposal (IAP):

* No Change to the regulations, studies do not support taking action.

**7.1.5 RCC** - **Document APG19-2/INF-05**

The RCC Administrations do not oppose possible revision of Article **21**, Table **21-4** for non-GSO FSS satellites, with a view to enabling new non-GSO systems to operate in these FSS frequency bands, while ensuring that existing primary services, i.e. the mobile service and fixed service, are protected, and maintaining the existing Article **21** pfd limits for GSO networks in the frequency band 3700−4200 MHz (space-to-Earth).

The RCC Administrations consider that when reviewing RR Article **22** epfd↓ and epfd↑ limits for new non-GSO systems in the frequency bands 3700−4200 MHz (space-to-Earth), 5925−6425 MHz (Earth-to-space), 4500−4800 MHz (space-to-Earth) and 6725−7025 MHz (Earth-to-space), it is necessary to ensure protection of GSO FSS networks, including allotments in the Plan and assignments in the Appendix **30В** List, without modification of their protection criteria.

The RCC Administrations consider that when determining operation conditions for new non-GSO FSS systems in the frequency bands 3700−4200 MHz (space-to-Earth), 5925−6425 MHz (Earth-to-space), it is necessary to protect existing non-GSO FSS systems in highly elliptical orbits.

In the radio frequency band 3700-4200 MHz (space-to-Earth) CEPT does not object to a possible revision of Table **21-4** of Article **21** for non-GSO FSS satellites, while ensuring that existing primary services, i.e. the mobile service and fixed service, are protected and maintaining the existing Article **21** pfd limits for GSO networks.

When developing technical and operational conditions and regulatory provisions for new systems of non-GSO FSS, there is a need to ensure protection of existing terrestrial services in the frequency bands 4500-4800 MHz (space-to-Earth), 5925-6425 MHz (Earth-to-space) and 6725-7075 MHz (Earth-to-space).

**7.2 International Organisations**

**7.2.1 IARU** - **Document APG19-2/INF-06**

None.

**7.2.2 ICAO** - **Document APG19-2/INF-02**

To oppose any new or changes to existing regulatory provisions in Article **21** of the ITU Radio Regulations for the frequency bands 3 700 - 4 200 MHz and 5 925 - 6 425 MHz unless it has been demonstrated through agreed ITU-R studies that there will be no impact from the potential introduction of new non-geostationary-satellites on aviation use in those bands.

To oppose introduction of new non-geostationary-satellites in frequency bands near to the frequency band 4 200 - 4 400 MHz unless aviation use of that band is ensured through agreed ITU-R studies.

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