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**PLENARY MEETING**

**Addendum 3 to  
Document 6384(Add.21)-  
E  
9 September 2019  
Original: English**

**Member States of the Inter-American Telecommunication Commission (CITEL)**

**PROPOSALS FOR THE WORK OF THE CONFERENCE**

**Agenda item 9.1(9.1.3)**

9 to consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with Article 7 of the Convention:

9.1 on the activities of the Radiocommunication Sector since WRC-15;

9.1 (9.1.3) Resolution **157 (Rev.WRC-15)** - 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 allocated to the fixed-satellite service

**BACKGROUND**

The Report of the Director of the Radiocommunication Bureau to WRC-15 acknowledged that there may be a need for “reviewing or confirming” assumptions that led to the development of the power limits found in Article **21** and Article **22**, taking into account the characteristics of non-GSO systems recently submitted to the ITU-R. Moreover, given the growing interest in deploying non-GSO FSS systems, the Report of the Director of the BR noted that there is a need to ensure that all existing services are adequately protected.

As a result, WRC-15 adopted Resolution **157** (WRC-15), which discusses how facilitating the deployment of new types of non-GSO systems has the potential to augment the capacity, spectrum efficiency and benefits derived from GSO and non-GSO systems operating in the bands 3 700-4 200 MHz (space-to-Earth), 4 500-4 800 MHz (space-to-Earth), 5 925-6 425 MHz (Earth-to-space), 6 725-7 025 MHz (Earth-to-space).

There are approximately 170 GSO satellites currently operating in the 3700-4200 MHz band and 229 allotments in the 4500-4800 MHz band, both of which are globally allocated to provide C-Band FSS downlinks. Many highly sensitive and public services use the FSS C-band, such as satellite telemetry, disaster relief, public meteorological data distribution, and aeronautical applications in various regions. A number of next-generation NGSO systems are being developed that can provide high-capacity, low-latency communications to end users in all locations around the world, thus

allowing those living and working in rural and remote areas to access the same level of connectivity as those living in more densely populated urban areas.

Resolution **157** (WRC-15) also contains a list of technical and operational issues (e.g. Article **21** and **22**) to be studied for the bands identified above; requests the development of new regulatory provisions for the protection of terrestrial services in the band 4 500-4 800 MHz and non-GSO MSS feeder links receiving stations in the band 6 700-7 075 MHz; and the clarification of some existing regulatory provisions (e.g. **5.440A** and **5.457C**).

CITEL Administrations supported studies under Resolution 157 (WRC-15) for new non-GSO FSS satellite systems. Its view was that modification to Article 22 for the inclusion of epfd limits for non-GSO FSS systems in the bands 4 500-4 800 MHz (space-to-Earth) and 6 725-7 025 MHz (Earth-to-space) to protect the geostationary FSS allotments in the Plan and the assignments in the Appendix 30B List can only be considered in conjunction with modifications to Article 5, including No. 5.441 to authorize use of these bands by non-GSO FSS systems. This footnote specifies that the use of the bands by the FSS shall be in accordance with Appendix 30B, which is limited to the geostationary-satellite of the fixed-satellite service. This is not the case in the bands 3 700-4 200 MHz and 5 925-6 425 MHz where non-GSO FSS are currently allowed without any restrictions in Article 5.

Similarly, CITEL Administrations view was that the adoption of regulatory measures to protect terrestrial services in the band 4 500- 4 800 MHz (space-to-Earth) can only be considered in conjunction with modifications to No. 5.441.

CITEL Administrations also noted that under the current regulatory framework, the protection of the non-GSO MSS feeder link receiving earth station from non-GSO FSS transmitting earth station in the band 6 700 -6 725 MHz and 7 025- 7 075 MHz is ensured through the application of coordination procedures under No. 9.17A (see also Table 9a in Appendix 7). An extension of these coordination procedures to the band 6 725-7 025 MHz can only be achieved through modifications to No. 5.441 referred to above.

## **RESULTS OF STUDIES**

In accordance with Resolution 157, a study was presented at the May 2017 meeting of ITU-R WP4A regarding sharing between circular-orbit non-GSO systems and GSO systems. This study considered the operation of a representative circular-orbit non-GSO system providing global broadband services. EPFD↓ profiles were generated based on the collected statistics of non-GSO system operation and compared against the protection criteria in given in Recommendation ITU-R S.1323.

The simulation results of this study indicate that the operation of a circular-orbit non-GSO system in the 6/4 GHz bands results in large exceedances when tested against the Recommendation ITU-R S.1323 protection requirements. These results can be attributed to calculation of protection to the GSO as given in Recommendation ITU-R S.1323, methodology A. This methodology computes interference based on a comparison of the degradation due to propagation loss with the degradation due to interference. In the 6/4 GHz band, there is minimal degradation due to propagation losses and thus the margin for protection is almost entirely dominated by the interference statistics.

**NOC**      **IAP/6384A21A3/1**

**ARTICLE 21**

**Terrestrial and space services sharing frequency bands above 1 GHz**

**NOC**      **IAP/6384A21A3/2**

**ARTICLE 22**

**Space services<sup>1</sup>**

**SUP**      **IAP/6384A21A3/3**

**RESOLUTION 157 (WRC-15)**

**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 allocated to the fixed-satellite service**

**Reasons:** ITU-R studies show 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, CITEL Administrations support no revision to Article 21, Table 21-4 for non-GSO FSS satellites in the frequency band 3700-4200 MHz (space-to-Earth) and no modifications to Article 22 epcf limits applicable to non-GSO systems in the bands 3700-4200 MHz (space-to-Earth) and 5925-6425 MHz (Earth-to-Space). Similarly, CITEL Administrations propose no change to the bands 4500-4800 MHz (space-to-Earth) and 6725-7025 MHz (Earth-to-space).