



ASIA-PACIFIC TELECOMMUNITY

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Group for WRC-27 (APG27-2)**

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India (Republic of)

### **PROPOSAL FOR PRELIMINARY VIEWS ON WRC-27 AGENDA ITEM 1.3**

*Agenda 1.3 to consider studies relating to the use of the frequency band 51.4-52.4 GHz to enable use by gateway earth stations transmitting to non-geostationary-satellite orbit systems in the fixed-satellite service (Earth-to-space), in accordance with Resolution 130 (WRC-23);*

Resolution 130 (WRC-23) – Studies relating to the use of the frequency band 51.4-52.4 GHz to enable use by gateway earth stations transmitting to non-geostationary-satellite orbit systems in the fixed-satellite service (Earth-to-space).

*Resolution 130 (WRC-23) resolves to invite the ITU Radiocommunication Sector to complete in time for the 2027 world radiocommunication conference:*

- 1 sharing and compatibility studies with existing services, including in adjacent bands ,including protection of the fixed and mobile services, and studies relating to the suitability of revising conditions associated with the primary allocation to the FSS in the frequency band 51.4-52.4 GHz (Earth-to-space) to enable its use by gateway earth stations of non-GSO FSS systems (Earth-to-space), and the relevant regulatory studies.*
- 2 compatibility studies between non-GSO FSS gateway operation in the frequency band 51.4-52.4 GHz and the existing primary passive services operating in the frequency band 52.6- 54.25 GHz in order to review and revise Resolution 750 (Rev.WRC-19) to protect the EESS (passive), considering the aggregated interference from GSO gateway earth stations and non-GSO FSS gateway earth stations and taking into account that the existing limits for GSO FSS networks to protect the EESS (passive) operating in the frequency band 52.6-54.25 GHz established in Resolution 750 (Rev.WRC-19) continue to apply for those GSO FSS networks that were notified/brought into use before a date to be defined at WRC-27;*
- 3 studies on sharing and compatibility between non-GSO FSS gateway operation in the frequency band 51.4-52.4 GHz and the radio astronomy observations carried out in the frequency band 51.4-54.25 GHz in conformity with No. 5.556, in order to determine the conditions to ensure the protection of these observations.*
- 4 studies regarding the protection of GSO FSS space stations from the emissions of non-GSO FSS gateway earth stations, including possible associated regulatory actions and possible inclusion of the frequency band 51.4-52.4 GHz in the scope of Resolutions 769 (WRC-19) and 770 (Rev.WRC-23),*

**Background:**

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*Resolves* 4 of the Resolution **130 (WRC-23)** invites ITU-R to conduct studies regarding the protection of GSO FSS space stations from the emissions of non-GSO FSS gateway earth stations, including possible associated regulatory actions and possible inclusion of the frequency band 51.4-52.4 GHz in the scope of Resolutions **769 (WRC-19)** and **770 (Rev.WRC-23)**. These Resolutions implement the Radio Regulations (RR) Nos. **22.5M** and **22.5L** criteria, respectively. According to Nos. **22.5L** and **22.5M**, non-GSO systems operating in the 37.5-39.5 GHz, 39.5-42.5 GHz, 47.2-50.2 GHz and 50.4-51.4 GHz bands shall not exceed a single-entry permissible allowance of, at most, a 3 % reduction and an aggregate allowance of, at most, an 8% reduction, in the time-weighted average spectral efficiency calculated on an annual basis for generic GSO reference links. Usually, GSO network are designed with a certain expected level of throughput and spectral efficiency performance and the associated guarantees in terms of availability of that performance. Such performance metrics are mainly defined for time objectives between 90% and 99%. It indicates a minimum percentage of time for which a specific service performance is maintained, for example a certain a data rate for at least 98% of the time. It is, therefore, necessary that specific performance objectives are considered when evaluating the impact of non-GSO interference on GSO networks.

Furthermore, Recommendation ITU-R S.2131 provides a method for determining performance objectives for satellite hypothetical reference digital paths utilizing ACM and defines the average loss in throughput. Critically, however, this recommendation does not specify the time period over which this criterion should be computed, which is addressed in Note 4 of the document. Note 4 states that the time-average throughput *over* any year does not provide sufficient information on link performance for specific time percentages for any given time period *during* the year. Additional performance requirements in terms of throughput/spectral efficiency as a function of the year's percentage also need to be considered in the overall performance assessment of links using ACM, warranting further studies.

Clearly, from the above explanations and analysis, the annual average throughput criteria, which is adopted in the adjacent FSS bands in these frequency ranges, should not be the determinant for assessing non-GSO system emissions impact on GSO link performance. The EPFD approach is a longstanding methodology that has been used in other bands where GSO networks and non-GSO systems have been widely deployed. It takes into account large number of GSO links and performance objectives leading to a robust long term and short-term protection criteria that are representative of real operation. On the other hand, the time-weighted average throughput degradation methodology is a theoretical computation over a long period of time that does not provide accurate information on the actual impact to GSO networks.

### **India's Preliminary Views:**

India supports the development of regulatory frameworks, including the technical conditions and regulatory provisions, for the use of the frequency bands 51.4-52.4 GHz by non-GSO gateway earth stations, taking into account the protection of incumbent primary services in these frequency bands and adjacent bands.

We also support that ITU-R regulatory frameworks for protection of incumbent primary services should be consistent across various bands, while noting that the existing assumptions and regulations under Resolution 769 and Resolution 770 do not adequately protect GSO networks, and EPFD framework is a better approach. Further studies are required to define appropriate EPFD limit value and associated reference antenna pattern characteristics..