



WRC-19 Agenda Item 1.6: Facilitating non-GSO operations in 40/50 GHz

Overview: WRC-19 agenda item 1.6 seeks technical and regulatory provisions to facilitate the operation of non-geostationary satellite orbit (“non-GSO”) FSS satellite systems in the frequency bands 37.5-42.5 GHz (space-to-Earth), and 47.2-50.2 GHz and 50.4-51.4 GHz (both Earth-to-space), while ensuring protection of GSO and EESS services. The GSC goal is to facilitate operation of these next-generation non-GSO systems in portions of the 50/40 GHz band by defining clear protection requirements and sharing procedures that ensure compatible operation with GSO FSS and EESS systems in these bands. This can be accomplished through new provisions in Article 22 combined with a Draft New Resolution to manage the aggregate impact from all non-GSO systems along with proven operational mitigation measures to ensure EESS (passive) stations are protected.

Background and ITU-R Studies: Next-generation non-GSO FSS systems are currently being developed that can provide high-capacity broadband services to end users in locations around the world and to be a critical part of the 5G ecosystem. These systems will operate in portions of the 50/40 GHz band. These systems can deliver affordable, advanced communication services with high capacity thanks to antenna designs, spectrally-efficient frequency reuse, greater antenna directivity, and other advanced communication techniques. Further, due to the relatively low altitude in which these systems operate, these systems are able to operate with low latency.

Although there is an existing FSS allocation in the band that already permits operation of non-GSO FSS systems on a non-interference basis, there are no ITU-R defined protection requirements or sharing procedures for the sharing of frequency bands between non-GSO and GSO FSS systems. Agenda Item 1.6, therefore, seeks the development of technical and regulatory frameworks to allow for the operation of these next-generation non-GSO fixed-satellite service (FSS) systems in the 50/40 GHz range. Such frameworks in the 50/40 GHz band will provide regulatory certainty to allow non-GSO satellite systems to efficiently operate in these existing FSS frequency bands, while still protecting GSO satellite systems.

ITU-R studies concluded that the protection of GSO networks is possible based on a protection criterion that considers both the short-term and long-term performance objectives of the GSO networks and bandwidth efficiency to enable use of these frequency bands by non-GSO FSS systems. These procedures allow for maximum flexibility in the design and operation of non-GSO systems, while ensuring protection of current and planned GSO operations, therefore significantly enhancing spectral efficiency use of the 50/40 GHz bands. A Resolution has also been developed to ensure that the aggregate emissions from all operating non-GSO FSS systems do not exceed aggregate protection requirements of GSO networks.

The ITU-R studies have also addressed unwanted emissions from non-GSO FSS earth stations into the EESS (passive) band, 50.2-50.4 GHz. These studies demonstrate that the EESS (passive) protection criteria may be exceeded for short periods of time unless new unwanted emission limits are established for non-GSO FSS systems operating in adjacent bands. Some studies also suggest the unwanted emission limit for GSO FSS earth stations should change; however, this is outside the scope of this Agenda item.



The GSC recommends that administrations support adoption of the following provisions:

- New Article **22** provisions containing a short-term single-entry criterion of 3% and an aggregate criterion of 10% increase in the unavailability and percent throughput caused by non-GSO operations to limit the level of interference generated into GSO systems (Method A of the draft CPM Report).
- A WRC Resolution, as described below to ensure that the aggregate emissions from all operating non-GSO FSS systems do not exceed this 10% aggregate protection criterion for GSO networks (Method A).
 - A mandatory consultation process involving all administrations operating or planning to operate non-GSO FSS systems in these bands, coupled with a pro rata reduction of emissions by every operational non-GSO FSS system in order to protect the GSO networks from any exceedance of the 10% aggregate criterion.
- Apply No. **9.12** coordination procedures to non-GSO satellite systems in the 50/40 GHz (Method A)
- A modification to Resolution **750** unwanted emission limits for non-GSO FSS in the bands adjacent to 50.2-50.4 GHz to -13/-23 dBW would protect adjacent EESS systems from the contribution of non-GSO effects above current Resolution 750 defined levels (Method A, Option 4 for non-GSO in the modified Resolution **750**) or a flexible limit using orbital avoidance measures allowing non-GSO FSS systems to effectively use the FSS allocations while providing sufficient protection to EESS.
- Resolution **159** under AI 1.6 does not address possible changes to current restrictions for GSO satellite networks to protect EESS.