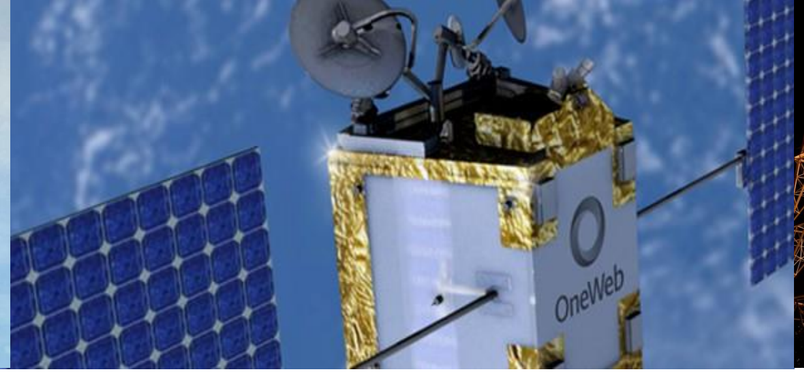
Connectivity

OneWeb Views on WRC-23 Satellite Agenda Items

3rd India Spectrum Management Conference

Oct 2023



22 October 2022 – Launch 14 – ISRO LVM3

Space is the future for communications on Earth.

- OneWeb is an end-to-end LEO constellation that supplies broadband-style data speeds to every part of the world.
- Our network is first LEO constellation to complete its space segment deployment (634 Satellite deployed)
- 23 operational gateways worldwide, 20+ more underway.
- Commercial service started (Alaska, Canada, UK, Europe, Australia, New Zealand…). Full global coverage by end 2023
- Sept 23: Merged with Eutelsat to become Eutelsat Group, global leader in space communications and the first combined LEO and GEO operator

HM Government bharti EUTELSAT HUGHES NETWORK SYSTEMS SoftBank Hanwha

Agenda Item 7 Topic A – Orbital Tolerances

The purpose of the Orbital Tolerances topic is to limit differences between the notified and deployed orbital characteristics in the following situations:

1. For BIU or BBIU a filling
2. For operational constraints
3. Meet milestones for Resolution 35

As an example, this was proposed to prevent the BIU of a MEO filing with a LEO satellite. Hence, a tolerance was needed.

It would define the maximum variation in altitude and in inclination for any of the satellites which could be used for BIU a filing and would limit the operations of the system.

- Issues:
  - Adopting tolerances smaller than what operational NGSO systems like OneWeb need to safely operate their fleets
  - Adopting small tolerances that restrict the ability to accommodate multiple systems in the same orbital space while still operating within each operator's ITU filing

Agenda Item 7 Topic A – Orbital Tolerances

- Restricting altitude deviations may prevent accommodation of other systems if severe penalties apply for operating outside ITU filing
- Administrations can require smaller operational tolerances and reach operational agreements outside of ITU regulatory environment
- OneWeb supports a large tolerance that can provide flexibility to operators to accommodate their system while ensuring that other operators can use the same orbit.
- OneWeb supports Method A2 with **a formula based** altitude tolerance + Option A for the Resolution to apply these tolerances
  - Resolves Option A2A4
  - Option 1 in the Annex with ΔaltAllowed = **6%** below 2000km and **120 km** above 2000km

Agenda Item 7 Topic B – Post-Milestone procedure

- WRC-19, Resolution 35 introduced milestones for NGSO systems
- Res35 includes resolves 19 which applies regulatory procedures for NGSO systems which have completed the milestone process
- Agenda item 7B is concerned with reviewing Resolution 35 resolves 19 and possibly adopting a post-milestone procedure for NGSO systems that have completed all milestones and subsequently reduced the number of space stations deployed

Given the earliest NGSO FSS systems will not complete their milestones until 1st February 2028, WRC-27 will occur prior to this last milestone

- OneWeb supports addressing this issue at WRC-27 after more experience has been gained with the Resolution 35 milestone process and the actual deployment of NGSO systems
- OneWeb supports **Method B1 – NOC**

The current PACP is rushing to make a decision at WRC-23, yet there is no agreement on the options and threshold.

CITEL common proposal is NOC, a Multi Country Proposal led by India based on B1 NOC is necessary

Agenda item 7 - Topic J- Background

- NGSO Systems/Network shares the spectrum bands allocated for the FSS, which is also shared with GSO FSS and BSS networks.
- Resolution **76** set forth limits on aggregate epfd radiated by non-GSO FSS systems in certain frequency bands to ensure the protection of the GSO FSS and BSS networks for different Ku and Ka frequency bands and antennas diameters.
- However, there is no clear methodology nor procedures outlined in Resolution **76** for the administrations involved to collaboratively determine whether these aggregate levels are exceeded and what actions should be taken.
- Topic J aims to address this by developing or calling for the development of a consultation process to be applied to non-GSO FSS-systems operators to avoid and potentially remedy any exceedance of the aggregate interference levels in Tables 1A to 1D of the Resolution based on accurate modelling of non-GSO systems.

Agenda item 7 Topic J – OneWeb View

OneWeb supports Method J5, and also the following provisions in general in all methods as general principle:

- Systems with a minimum number of operational satellites identified under Resolution 35 under resolves 7 & 8 should be taken into account in determining aggregate EPFD & addressed in consultation meetings
- NGSO systems submitted under multiple ITU filings should be treated as a single system for purposes of Resolution 76
- An accurate aggregate calculation method is needed before holding consultation meetings

There is no PACP on this topic.

J5 was supported by countries in Region 2 and 3 (USA, Singapore, Equator,…). India could lead the Multi country proposal into WRC-23

AI 10: WRC-27 Future Agenda - NGSO in band 51.4-52.4 GHz

- OneWeb supports WRC-27 agenda item to “conduct Studies relating to the use of 51.4-52.4 GHz to enable the use by gateway earth stations in the fixed-satellite service operating with a space station in non-geostationary-satellite orbit (Earth-to-space)”
- The band 51.4-52.4 GHz frequency band is allocated on a primary basis to the fixed-satellite service (FSS) in the direction Earth-space;
- In accordance with 5.555C of the RR, the use of the 51.4-52.4 GHz by the fixed-satellite service (Earth-space) is limited to geostationary satellite networks, and Earth stations shall be limited to head-end earth stations with a minimum antenna diameter of 2.4 meters.
- The need for additional spectrum in the FSS in the 50 GHz range for Earth-to-space links of non-GSO earth station systems was established in response to WRC-19 agenda item 9.1.9 in ITU-R Report S.2461. These studies concluded that the need for spectrum for GSO and non-GSO SFS networks.

Allocation to services		
Region 1	**Region 2**	**Region 3**
51.4-52.4	FIXED FIXED-SATELLITE (Earth-to-space) 5.555C MOBILE 5.338A 5.547 5.556	

There is no PACP, OneWeb invites member states to consider conducting studies for expanding the use of the FSS (Earth-space) band in 51.4-52.4 GHz to address the spectrum needs of non-GSOs for earth station in the FSS operating with a space station in non-geostationary-satellite orbit (Earth-to-space), by WRC-27

AI 10: WRC-27 Future Agenda - NGSO operation in 13.75-14.0 GHz

OneWeb proposes WRC-27 agenda item *"to review the use of the band 13.75-14 GHz and study possible revisions to the constraints adopted by RR Nos. 5.502 and 5.503, in accordance with Resolution [13.75-14 GHz] (WRC-23), to enable efficient use of the band by* ***non-GSO FSS*** *earth stations* ***as well as GSO FSS*** *earth stations"*

- There has noted rapid increase in the number of (GSO) and (non-GSO) satellite networks in recent decades.
- The use of smaller FSS earth stations at frequencies around 10-15 GHz has also been increasing with the deployment of satellites providing large throughput and broadband connections.
- The 13.75-14 GHz band was allocated globally by WARC-92 for FSS on primary basis for (Earth to space) director
- Meanwhile the use of the FSS allocation is subject to limitations were introduced in RR Nos. 5.502 (antenna diameter limitation of 4.5 meter for NGSO and 5.503 (limitation to the e.i.r.p density emissions)
- WRC-03 modified these footnotes 20 years ago, those limitation hinders the efficient use of smaller non-GSO FSS uplink earth station antennas.

Allocation to services		
Region 1	**Region 2**	**Region 3**
13.75-14	FIXED-SATELLITE (Earth-to-space) 5.484A RADIOLOCATION Earth exploration-satellite Standard frequency and time signal-satellite (Earth-to-space) Space research 5.499 5.500 5.501 5.502 5.503	

OneWeb invites member states to consider review the constraints imposed on non-GSO uplink earth stations and GSO uplink earth stations in the fixed-satellite service in the frequency band 13.75-14 GHz in Earth to Space direction, by WRC-27, instead of WRC-31 as in the PACP

eutelsat GROUP

Thank you