

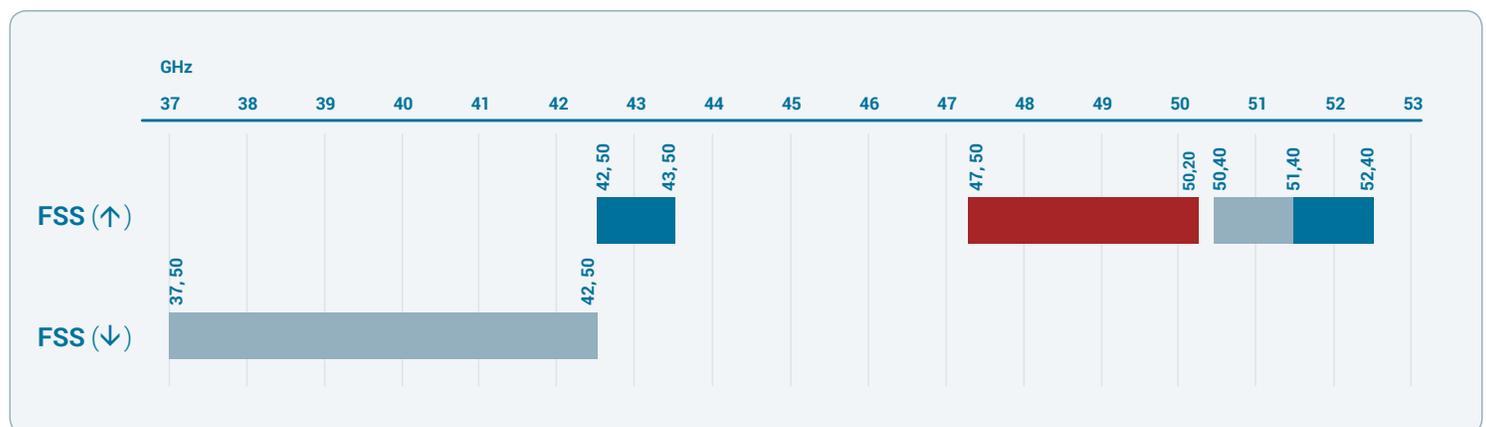
## Agenda Item 9.1, Issue 9.1.9: New FSS allocation at 51.4-52.4 GHz

**Overview:** Under Agenda item 9.1, Issue 9.1.9, Resolution 162 (WRC-15) calls for studies on spectrum requirements and the possible allocation of the frequency band 51.4-52.4 GHz to the fixed-satellite service (FSS) (Earth-to-space). For satellite systems to deliver broadband services with high data rates to accommodate user demand, substantial forward link spectrum is needed (i.e., gateway uplinks and user terminal downlinks). As a result, GSC supports allocation of 51.4-52.4 GHz to FSS in the uplink direction to support this gateway requirement.

**Background and ITU-R Studies:** Satellite systems are increasingly being used to deliver broadband services with high data rates to accommodate user demand and service expectations worldwide. Next-generation satellite networks are expected to be able to provide data rate services of greater than 1 Gbit/s on a single channel to users regardless of location.

Current HTS systems are mainly operated in Ka-band and use the Earth-to-space allocations for both user links and gateway links. The hundreds of currently operating Ka-band satellite networks lead to the current scarcity of spectral resources in this frequency band. In order to increase the capacity of HTS systems and improve the services provided to end-users, it is proposed to expand the FSS (Earth-to-space) allocation in the 50 GHz frequency band for gateway uplinks (from gateway to space station) in order to facilitate freeing up the Ka-band FSS (Earth-to-space) allocation for user uplinks (from user terminals to space station). Therefore, the consideration of new primary allocations to the FSS in the frequency band 51.4-52.4 GHz (Earth-to-space) could help in that perspective.

The following figure shows the current primary allocations to the unplanned FSS Earth-to-space and space-to-Earth. The segment under study for a new FSS allocation is also shown, indicating how this new allocation would create an asymmetry to increase uplink spectrum.



In preparation for WRC-19, WP 4A developed two Reports; one on spectrum needs for development of the FSS and the second one on sharing and compatibility between FSS and existing services.

As indicated in the CPM Report, the spectrum needs were analyzed, and it was concluded that the additional allocation to the FSS being considered is beneficial to make broadband connections provided by HTS systems more widely accessible.



Additionally, the outcome of the studies has demonstrated the possibility of sharing and compatibility with the appropriate protection measures.

**Based on results from studies**, the additional allocation in frequency band 51.4-52.4 GHz to the FSS fixed-satellite service (Earth to space), limited to FSS gateway links for geostationary orbit use could be done ensuring adequate protection to existing radio services in - and in adjacent band such as:

- Appropriate separation distances between FSS earth stations and FS, IMT 2020 base stations and Radio astronomy observation stations would ensure adequate protection of incumbent services ;
- Appropriate unwanted emission limitations applicable to FSS earth stations are able to ensure due protection of NGSO EESS system operating in the adjacent band (52.6-54.25 GHz);
- The protection of future GSO EESS (passive) sensors could be ensured by angular separations between GSO FSS and GSO EESS (passive) satellites in the order of 0.0-3.2 degrees. Two options are now included in CPM text to address this issue:
  - **Option 1:** Ensuring a sufficient angular separation in the GSO arc between the FSS and the EESS (passive) space stations depending on the FSS ES unwanted emission levels (coordination on case by case basis).
  - **Option 2:** Giving priority to a limited number of orbital positions (predefined in the option) in the GSO arc for the operation of GSO EESS (passive) sensors. The GSO FSS networks with space stations located at less than 3.2 degrees separation of such positions should adjust the unwanted emission levels from earth stations to protect the EESS (passive) sensors on board the GSO satellite.

**The GSC recommends** that WRC-19 add an allocation to the FSS in the 51.4-52.4 GHz band (Earth to space), limited to FSS gateway links for geostationary orbit use, and establish the required regulatory measures to protect co-primary services and services in adjacent bands.