GSOA

Agenda Item 1.13

WRC-27 Agenda Item 1.13

Studies on possible new allocations to the mobile-satellite service for direct connectivity between space stations and International Mobile Telecommunications (IMT) user equipment to complement terrestrial IMT network coverage.

Overview

This Agenda Item studies possible new allocations to the mobile-satellite service (MSS) for direct connectivity between space stations and International Mobile Telecommunications (IMT) user equipment (herein referred to as 'DC-MSS-IMT') to complement terrestrial IMT network coverage in the frequency range between 694/698 MHz and 2.7 GHz, taking into account the IMT frequency arrangements addressed in the most recent version of Recommendation ITU-R M.1036, in accordance with Resolution **253 (WRC-23)**.

Background

The envisaged DC-MSS-IMT satellite system which communicates directly with IMT user equipment utilized spectrum in terrestrial IMT networks may provide complementary coverage for mobile connectivity from space as part of IMT networks to areas such as high mountains, remote islands and deserts, where it may not be sufficient to deploy terrestrial base stations.

Currently, several DC-MSS-IMT satellite systems are being launched or planned for launch aiming to work with IMT user equipment (pre 3GPP Release 17 NTN specifications) by utilizing spectrum allocated to the Mobile Service (MS). The operation of these DC-MSS-IMT systems in MS bands is currently a non-conforming use of the spectrum due to the absence of an appropriate regulatory framework. To address this shortfall in the regulatory framework, some administrations have taken interim steps to develop a domestic regulatory framework within their national territory. However, there is still a need to address cross-border coordination from both the space and terrestrial perspectives. The risk of not having a clear regulatory framework may either deter the deployment of DC-MSS-IMT or lead to further national authorizations by using RR No. **4.4** for international spectrum management.

Key Points

- Refer to GSOA whitepaper for the two variants of satellite direct-to-device (D2D) applications referred to as "D2D in MS bands" and "D2D in MSS bands", where the former is to be studied under this Agenda item, while the latter is a variant that could support D2D under existing MSS allocations without changes to RR. [1]
- For this Agenda Item, studies should consider the downlink of the DC-MSS-IMT where the interference to terrestrial mobile networks may occur either towards IMT user equipment (in the same directionality of IMT frequency arrangement) or towards IMT base station (in the opposite directionality of IMT frequency arrangement), but noting that protection is only required in the applicable IMT frequency arrangement

1. GSOA Whitepaper, "The Future of Satellite Connectivity: Various Approaches to Direct-to-Device Services" - https://gsoasatellite.com/reports_and_studies/the-future-of-satellite-connectivity-various-approaches-to-direct-to-device-services/

as deployed in the country requesting protection. There are other scenarios that studies should consider where interference from a downlink of the DC-MSS-IMT may occur in the opposite directionality towards a current MSS uplink allocation in a single ITU region or from one region to another and scenarios where adjacent use between DC-MSS-IMT and MSS is envisaged.

- There is no need to study the uplink of the IMT user equipment towards space station of DC-MSS-IMTs system since this direct connectivity involves the same IMT user equipment using the same technical parameters as IMT user equipment operating with a terrestrial IMT base station that could transmit in existing IMT frequency arrangements. Thus, no additional regulatory measure would be needed for IMT user equipment in the MSS uplink direction when operating under the same technical characteristics as terrestrial IMT uplink.

GSOA Position

- GSOA supports studies for a possible new allocation to MSS in existing frequency bands identified for terrestrial IMT in the frequency ranges 694-960 MHz, 1427-1518 MHz, 1710-1980 MHz, 2010-2025 MHz (except Region 2 that has already been allocated with MSS in Earth-to-space direction), 2110-2170 MHz, 2300-2400 MHz and 2500-2690 MHz to complement terrestrial IMT network coverage.
- DC-MSS-IMT systems should not constrain the development of incumbent services and systems operating under those service allocations in co-channel or adjacent channel spectrum in one single region or across multiple regions. GSOA is of the view that the DC-MSS-IMT system should follow the same transmission directionality of the terrestrial IMT in the frequency range as deployed within the national territory where such DC-MSS-IMT is authorized to operate.
- GSOA is of the view that the studies must confirm the protection of incumbent services, particularly the protection of current MSS allocations from new potential MSS allocations proposing operations in opposite directions (an example of this is the protection of current uplink MSS allocations in 1980-2010 MHz from new potential downlink MSS allocations in 1930-2000 MHz, among others).
- GSOA also supports the notion that for IMT user equipment that is currently allowed to transmit within an IMT frequency arrangement to a terrestrial IMT base station, will continue to operate within the current framework, and therefore no additional regulatory measure would be needed for IMT user equipment in the MSS uplink direction when operating under the same technical characteristics as terrestrial IMT uplink.

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