GSOA
GLOBAL SATELLITE OPERATORS ASSOCIATION

Agenda Item 1.2

WRC-23 Agenda Item 1.2

Overview

This agenda item considers identification of IMT and possible allocations to the mobile service on a primary basis, in accordance with Resolution **245 (WRC-19)**, which sets out sharing and compatibility studies for the stated frequency bands:

- > 3300-3400 MHz & **3600-3800 MHz (R2)**
- > 3300-3400 MHz (amend footnote in R1)
- > **6425-7025 MHz (R1)**
- > **7025-7125 MHz (globally)**
- > **10000-10500 MHz (R2)**

GSOA Position

3600-3800 MHz (R2)	6425-7025 MHz (R1) 7025-7125 MHz (globally)	10-10.5 GHz (R2)
GSOA supports **No Change** to the ITU RR for 3600-3800 MHz in R2 but recognizes the various preferences for the use of 3600-3700 MHz in R2. GSOA is of the view that countries deciding to identify IMT up to 3700 MHz can include their names in footnote 5.434 instead of identifying the band regionally for IMT.	GSOA position is **No Change** to the ITU RR. Using 6425-7025 MHz in R1 and 7025-7075 MHz globally for IMT would lead to excessive interference making these bands unusable for FSS.	GSOA position is **No Change** to the ITU RR. If an IMT identification was considered in 10-10.5 GHz, the conditions to protect the EESS services globally should also include IMT unwanted/OOB emission limits to protect FSS above 10.7 GHz.

Background C-band downlink (3600-3800 MHz)

Countries in R2 rely heavily on C-band Fixed Satellite Services (FSS) to support critical services that cannot be provided as reliably or at all by other means, for multiple applications and industry verticals such as backhaul and trunking services for MNOs and Telcos. A high number of earth stations are deployed, including receive-only and bidirectional terminals, in business to consumer scenarios.

Satellite operators in R2 have long term plans and business interests for the use of 3600-3800 MHz (space-to-Earth) for both existing operations and future satellite systems. The band has unique characteristics such as wide coverage and resilience to rain fade. Higher frequency bands for FSS (such as Ku, Ka) are extensively used and face higher demand for existing and future GSO and NGSO systems, so they do not represent a suitable alternative.

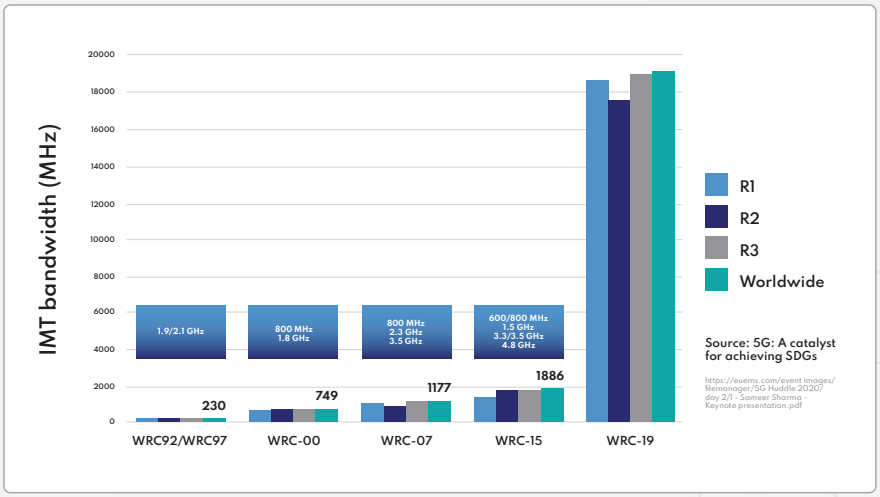
ITU-R sharing studies between IMT and FSS earth stations (Report ITU-R S.2368) showed that:

- To meet the long-term interference criterion, the required separation distances are in the tens of km
- To meet the short-term interference criterion, the required separation distances, including the effect of terrain, exceed 100 km
- When FSS earth stations are deployed in a ubiquitous manner or with no individual licensing, IMT and FSS sharing is not feasible in the same area (no minimum separation distance guaranteed)
- Deployment of IMT stations prevents future FSS earth stations from being deployed in the same area

Agenda Item
1.2

Note that a total of ~1GHz of spectrum is already allocated and identified for IMT in the mid-band (2-3.6 GHz) in R2, without the need to add further pressure to the satellite ecosystem. Most R2 countries will continue operating FSS earth stations in 3600-3800 MHz. Seven R2 countries are already listed in footnote 5.434 that identifies 3600-3700 MHz for IMT.

Figure 1: Amount of spectrum available for IMT



Background C-band uplink (6425-7025 MHz and 7025-7075 MHz)

- Minimal potential for IMT operations while protecting FSS uplinks (indoor use only, 10-15 dBm EIRP limit necessary)
- Sharing studies between IMT and FSS in 5925-6425 MHz (CEPT/ECC Report 302) demonstrated that sharing with unlicensed WiFi indoors is more feasible than sharing with IMT[1]
- ITU-R studies on 6425-7025 MHz, from GSOA and some administrations show excessive interference at the satellite. The studies that predict interference below the protection criterion are based on unrealistic assumptions.
- Some operators use 6425-6575 MHz for feeder uplinks to support all L-band MSS worldwide, necessary for operation of the Global Maritime Distress and Safety System (GMDSS), aviation safety services (AMS(R)S), and GNSS augmentation (SBAS)
- The issue goes beyond R1, even in the band 6425-7025 MHz, as satellites serving R2 and R3 have footprints overlapping with R1

Background C-band feeder links for NGSO MSS (6700-7075 MHz)

- 6700-7075 MHz is allocated to FSS globally (space-to-Earth) for NGSO feeder links for NGSO systems of the MSS
- Existing MSS systems have using all or a portion of these allocations continuously since 1998
- Satellite operators has plans to deploy a MEO satellite system and more gateway earth stations are planned
- 6700-7075 MHz is considered for the "IRIS2" satellite connectivity project of the European Union (EU)

Key Points

› In 6425-7075 MHz, studies conducted by GSOA and administrations show excessive interference to satellites, even with a very low IMT density. Any limit to protect satellite (e.g. 25 dB power reduction) would make IMT operations impractical. In other bands - e.g. 2655-2690 MHz - IMT already caused documented harmful interference to satellite receivers.

› In 10-10.5 GHz an IMT identification would generate excessive interference to the global EESS services in in 10-10.4 GHz (active) and in 10.6-10.7 GHz (passive). Although there is no FSS allocation in this band, FSS (space-to-Earth) is heavily used above 10.7 GHz. The conditions to protect EESS should also include IMT unwanted/OOB emission limits to protect FSS above 10.7 GHz. GSOA invites administrations to prioritise existing IMT identifications above 24 GHz to achieve the desired use cases (i.e. capacity hot-spots in urban scenarios).

› 14 countries in R1 already identified 3300-3400 MHz for IMT with great support for a regional harmonization. Also 7 countries in R2 already identified 3600-3700 MHz for IMT. Added to 3400-3600 MHz, this would support 300 MHz of contiguous bandwidth. This can be enough spectrum to satisfy IMT 5G needs.

1 Even though these two studies were done for the adjacent band, they are relevant to AI 1.2 since the technical characteristics assumed for IMT, FSS and WiFi systems are applicable also in the band 6425-7 025 MHz.