

# Frequency management related topics

Presented to CGMS-54 Plenary, 2 – 4 June 2026

## Frequency related **challenges** and **opportunities**, WRC-27 related

- Mega constellations: Potential RFI to passive microwave sensors from unwanted emissions of commercial satellite mega constellations (e.g. Starlink, Amazon LEO, SES O3B and others) adjacent to the passive bands at 50/52 GHz and 89 GHz (WRC-27 agenda items, 1.1, 1.3, 1.18).
  - WRC-27 AI 1.3 is dealing with the establishment of unwanted emissions into the passive band 52.6-54.25 GHz from neighbouring feeder uplinks at 51.4-52.4 GHz.
    - Interested players in ITU-R: Starlink, Amazon LEO, SES O3B, Chinese NGSO, France and SES for GSO.
  - WRC-27 AI 1.18 is dealing with the establishment of unwanted emission limits to protect the passive bands at 86-92 GHz, 114.25-116 GHz, 164-167 GHz and 200-209 GHz.
    - Interested players in ITU-R: Starlink at 81-86 GHz (also 92-94 GHz in the US).
- Temporary licenses are already granted (or are in the process of being granted) for some bands in some countries around the world, before decisions have been taken at WRC-27. These grants usually already contain some temporary unwanted emission limits.
  - For any such already issued licenses it will be important to update as necessary those limits, to be aligned with the outcome of WRC-27.

## Frequency related **challenges** and **opportunities**, WRC-27 related

- Radiolocation devices above 231.5 GHz: Potential RFI to passive microwave sensors from unwanted emissions to the passive bands (WRC-27 agenda items, 1.8).
  - WRC-27 AI 1.8 is dealing with the allocation of new spectrum for broadband radar-type radiolocation systems for detection purposes e.g. for automotive, security scan/track, military, mobile, etc. applications in bands above 231.5 GHz.
  - The commonly applied principle in the framework of WRC-27 preparations is to minimize the RFI potential by avoiding co-channel operations, thus not to provide new allocations/identifications in overlap with passive sensors.
    - Despite the generally agreed approach to avoid overlap with passive sensing bands, there is an automotive radiolocation device (Teradar) that plans to operate in a band in overlap with the passive sensing channels around 325 GHz.
      - Such high-density automotive application in overlap with a passive sensing channel at around 325 GHz could result in RFI in the long-term and once such mass-market equipment is being implemented in cars it could not be easily removed from the market.

## Frequency related **challenges** and **opportunities**, WRC-27 related

- International Mobile Telecommunication (IMT) (5G): Identification of the range 7125-8400 MHz (or parts thereof) for future use by IMT (WRC-27 agenda item 1.7).
  - The protection of data reception from MetSat and/or Earth Observation (EO) satellites in X-Band requires sufficiently large protection/coordination zones around the Earth stations for data reception from MetSat and/or EO satellites in the frequency bands 7450-7550 MHz, 7750-7900 MHz and 8025-8400 MHz, used for the downlink from MetSat and EO satellites.
  - **Results of the ITU-R studies on the required protection/coordination zones vary from 1 to >150 km depending on the assumptions taken (and the author).**
- Possible new primary frequency allocations to EESS (passive) in the bands 4200-4400 MHz and 8400-8500 MHz for Sea Surface Temperature (SST) measurements (**on a non-protection basis**) to complement the SST measurements in the 6/7 GHz range (WRC-27 agenda item 1.19).
  - Compensation for the degraded usability and quality of the SST measurement data in the 6/7 GHz range due to the IMT identification in that range after WRC-23 decisions;
    - Vision: Future multichannel instruments utilising all three bands for SST measurements.

## Frequency related **challenges** and **opportunities**, WRC-27 related – reflection in the CGM HLPP

Section 2.2.1 of the HLPP stipulates to facilitate an effective preparation of national and ITU-R regional groups' positions for the World Radiocommunication Conference (WRC) 2027 favourable for CGMS-related issues, in particular but not exclusively with regard to the:

- Establishment of protection for passive microwave sensors in the bands 50.2-50.4 GHz, 52.6-54.25 GHz and in bands above 86 GHz from unwanted emissions from active services in neighbouring frequency bands (WRC -27 agenda items 1.1, 1.3, 1.8 and 1.18).
- Possible new primary frequency allocations to EESS (passive) in the bands 4200-4400 MHz and 8400-8500 MHz for Sea Surface Temperature (SST) measurements to complement the SST measurements in the 6/7 GHz range (WRC-27 agenda item 1.19).
- Protection of the frequency bands 7450-7550 MHz, 7750-7900 MHz and 8025-8400 MHz, used for the downlink from MetSat and EO satellites, from possible future frequency usage by International Mobile Telecommunications (IMT) (WRC-27 agenda item 1.7).

The corresponding **SFCG preliminary objectives** from SFCG-44, 10 – 18 June 2025, and the **preliminary positions of WMO** as updated at the recent 7th meeting of WMO ET-RFC, 4 – 6 February 2026 are **in line with the HLPP !**

## Further frequency related **challenges** (possible future WRC related)

- Studies in ITU-R Working Party 7C regarding the possible impact of NGSO fixed-satellite service (FSS) systems (with an apogee lower than 20 000 km) on passive sensors in the shared band 18.6-18.8 GHz.
  - Radio Regulations footnote 5.522B (WRC-2000) limits the use of the band 18.6-18.8 GHz by the FSS to geostationary systems and systems with an orbit of apogee greater than 20 000 km.
    - Will the satellite industry, driven by Amazon, attempt to initiate a future WRC agenda item with the aim to modify the Radio Regulations to allow such use? → **Most likely !**
      - Possible long-term consequences: Increase of the RFI potential when appropriate limits to protect passive sensing in this band are not implemented in the Radio Regulations by a future WRC.
  - Regarding the band 18.6-18.8 GHz there is still an ongoing assessment of the RFI potential from GSO FSS due to reflections from large bodies of water into passive sensors.
- Preliminary WRC-31 agenda items:
  - 2.1 (Extension of the frequency allocation table from 275 GHz to 325 GHz).
  - 2.6 (IMT (6G) in bands between 102 and 275 GHz).

## Further frequency related **challenges** (not WRC related)

- Growing number of instances of RFI to GEONETCast reception in C-Band:
  - In the framework of WMO ET-RFC workshop to the Arab region (Feb 2026) several countries reported about RFI to EUMETCast Africa (3848 MHz) due to aggregated unwanted emissions from 5G base stations in the vicinity of the affected satellite reception station.
    - Although GEONETCast (4080 MHz) and CMACast (4120 MHz) are operating still a bit further away in spectrum from 5G, in the long-term it can be expected that 5G will be operated gradually up to 4200 MHz in countries around the world (first countries already issued licenses), thus increasing the potential of RFI either from aggregated unwanted emissions or even in-band emissions from 5G base stations.
- Potential auctioning / repurposing of portions of the MetSat L-Band, 1675-1680 MHz, 1680-1695 MHz and 1695-1710 MHz to commercial mobile satellite systems in individual countries.
  - Possible use of portions of the MetSat L-Band for commercial mobile satellite systems in the context of the current trend of Supplemental Coverage from Space (SCS)/Direct to Device (D2D) for mobile (5G) networks.
    - SpaceX also seeks to provide SCS in the 1695-1710 MHz (Earth-to-space) on existing EchoStar license in the US.
  - Consequences to be considered and assessed against current/future L-Band broadcast services.

To be considered by CGMS:

**Action proposed:** CGMS is invited to note this report and to provide feedback to Working Group I as appropriate.

Thank you very much for your attention!