

WRC-27: The satellite-heavy WRC

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WRC-27 preparations

WRC-23 proposed the agenda for WRC-27, with a strong focus on space topics: fixed-satellite, mobile-satellite and scientific services.

The first WRC-27 **Conference Preparatory Meeting (CPM27-1)** was held in Dubai immediately after WRC-23 to distribute the preparatory work among the ITU-R working groups.

- Technical and regulatory studies
- Preparation of the ITU-R report to WRC (CPM report), to be approved in S1 2027

ITU Council in June 2024 adopted the agenda for WRC-27 in Resolution 1422.

European preparations began in spring 2024:

- **Conference Preparatory Group (CPG)** of CEPT, chaired by Stephen Talbot (G), held its first meeting in May 2024. Vice-chairs: Thomas Welter (F), Nadia Katsanou (GRC).
- **First RSPG opinion** on EU policies impacted by WRC-27 (H1 2025) to be followed by an opinion recommending EU positions (H2 2026) and then a Council decision in 2027.

FIXED-SATELLITE AND BROADCASTING SATELLITE

- 1.1 47.2-50.2 GHz / 50.4-51.4 GHz **Aeronautical/maritime ESIM**
- 1.2 13.75-14 GHz **Uplink Earth stations**
- 1.3 51.4-52.4 GHz **Gateway Earth stations**
- 1.4 17.3-17.7/8 GHz **Fixed/broadcasting allocation in Region 3**
- 1.5 **Unauthorized operations of NGSO Earth stations**
- 1.6 **Space sustainability**
37.5-42.5 GHz / 42.5-43.5 GHz / 47.2-50.2 GHz / 50.4-51.4 GHz
- 7 **Satellite regulatory issues**

CPM Chapter 1

FIXED, MOBILE AND RADIOLOCATION

- 1.7 4 400 – 4 800 MHz / 7 125 – 8 400 MHz / 14.8 – 15.35 GHz - **IMT**
- 1.8 **231.5 – 275 GHz / 275-700 GHz - Radiolocation**
- 1.9 **Aeronautical mobile (OR) high frequency modernization**
- 1.10 71 – 76 GHz / 81 – 86 GHz – **Power flux-density / power limits**

CPM Chapter 2

MOBILE-SATELLITE

- Space-to-space links**
- 1.11 1 518 – 1 544 MHz / 1 545 – 1 559 MHz
1 610 – 1 645.5 MHz / 1 646.5 – 1 660 MHz
1 670 – 1 675 MHz / 2 483.5 – 2 500 MHz
- 1.12 **MSS – Allocations for IoT development**
1 427 – 1 432 MHz / 1 645.5 – 1646.5 MHz
1 880 – 1 920 MHz / 2 010 – 2 025 MHz
- 1.13 **MSS – IMT-space stations connectivity**
- 1.14 **MSS – additional allocations**

CPM Chapter 3

SCIENCE

- 1.15 **Lunar communications**
- 1.16 **Radio Quiet Zones**
- 1.17 **Space weather sensor protection**
- 1.18 **≥ 76 GHz – Earth exploration service protection**
- 1.19 **Earth exploration-satellite service allocation**
4 200 – 4 400 MHz / 8 400 – 8 500 MHz

CPM Chapter 4

Structure of CPG27 – final

CPG Plenary

1.9 Aero HF AM(OR)S Appendix 26

CPG Project Team A

- 1.8 Radiolocation 231.5-275/700 GHz
- 1.15 Lunar Allocations
- 1.16 Radio Quiet Zones/RAS, from [ngso](#)
- 1.17 Receiving Space Weather Allocations
- 1.18 EESS passive & RAS above 76 GHz
- 1.19 EESS Passive 'SST' in 4 & 8 GHz

CPG Project Team B

Thomas Welter (F)

- 1.1 ESIMS to [gso/ngso](#) in 47.2 to 51.4 'V' GHz
- 1.2 smaller ES antennas in 13.75 – 14 GHz
- 1.3 [Ngso](#) gateway FSS E>s in 51.4-52.4 GHz
- 1.4 FSS s>E in regions across 17.3-17.7/8 GHz)
- 1.5 Unauthorized Operation, service area)
- 1.6 Equitable access in Q and V Bands
- 1.10 71-76, 81-86 GHz [eirp](#) & [pfd](#) FSS/FS/MS)
- 7 Satellite coordination procedures
- 9.2 Inconsistencies in the RRs via ITU Dir. Rpt)
- 9.3 Check satellite processes are equitable

CPG Project Team C

- 1.11 L Band space to space links [gso/ngso](#) for MSS
- 1.12 Low-data-rate non-geo MSS in L/S Bands
- 1.13 MSS in IMT Bands to complement MS IMT (see also PT1)
- 1.14 Additional MSS allocations
- 2 Review of incorporated Recs
- 4 Review of WRC Resolutions
- 8 Footnotes
- 10 Agendas for WRC-31/WRC-35

ECC PT1

Christoph Hildebrand (D)*

- 1.7 IMT 4.4, 7, 8 & 15 GHz
- 1.13 MSS in IMT Bands to complement MS IMT, technical studies, on the protection the of terrestrial component of IMT

* Appointed by ECC not CPG

Chapter 1

Agenda item 1.1 Agenda item 1.1 Aeronautical / maritime ESIM in Q/V band

Resolution 176 (Rev. WRC-23)

- Successful ESIM concept in FSS bands: ongoing interest in satellite connectivity solutions implemented in different modes of transport (land, air, sea)
- Scope of the studies for WRC-27:
 - Framework for ESIMs communicating with GSO networks and non-GSO systems;
 - Limited to Uplink bands 47.2-50.2 GHz and 50.4-51.4 GHz bands
 - Aeronautical (A-ESIM) & Maritime (M-ESIM) ESIMs; Terrestrial ESIM concept (L-ESIM) recognized, although not studied in the CMR framework: authorization of terrestrial ESIMs remains the prerogative of each administration;
 - Network control and monitoring center for ESIM station operation and "responsibility of administrations" aspects (cf. [Resolution 121\(1.15\)](#) and [Resolution 123\(1.16\)](#) of [WRC-23](#)).
- CEPT coordinator: Stephane Mebaley Ekome (Luxemburg, SES)

Chapter 1

Agenda item 1.2 Uplink Earth stations in 13.75 – 14 GHz

Resolution 129 (WRC-23)

- Satellite operators interested in complementing Ku-band uplink segment
- Critical uses of the radiolocation service for NATO countries (*cf.* WRC-03 studies).
- Coexistence: strong impact of limitations on antenna size

- CEPT coordinator: Alvaro de Vega (Spain, Hispasat)

Chapter 1

Agenda item 1.3 NGSO Gateway Earth stations in 51.4-52.4 GHz

Resolution 130 (WRC-23)

- Proposal to extend current FSS framework in the frequency band 51.4-52.4 GHz to non-GSO systems
- Current FSS allocation following WRC-19: framework limited to feeder links for GSO systems and for earth stations with antennas with a minimum diameter of 2.4 m.
- CEPT coordinator: Saemi Tanaka Aceves (The Netherlands, SES)

Chapter 1

Agenda item 1.4 Fixed/broadcasting allocation in Region 3 in 17.3-17.7/8 GHz

Resolution 726 (WRC-23)

- Follow-up to agenda item 1.19 of WRC-23, which led to the adoption of a regulatory framework for GSO/non-GSO sharing in Region 2 (including definition of efd limits).
- Interest from Region 1 (CEPT) to apply the efd limits adopted in Region 2 in the 17.3-17.7 GHz frequency band and to have harmonized efd limits to protection GSO in the 3 Regions.
- No additional constraints in Region 1.
- CEPT coordinator: none yet

Chapter 1

Agenda item 1.5 Unauthorized operations of NGSO Earth stations

Resolution 14 (WRC-23)

- Agenda Item with 2 subjects
 - How to prevent an earth station, when located in a territory where it is not authorized, to communicate in the **Earth-to-Space** direction with a **non-GSO** FSS/MSS system - administrations retain sovereignty over rights issued to earth station
 - Study on the possibility for an administration to **exclude its territory** from the service area of a non-GSO FSS/MSS system, **without affecting the service provided in the rest of the service area**

- CEPT coordinator: Kevin Le Vot (France, ANFR)

Chapter 1

Agenda item 1.6 Space sustainability in Q/V band

Resolution 131 (WRC-23)

- “Equitable access” theme prior to WRC-23: Resolution ITU-R 74 (AR-23)
- General regulatory point concerning equitable access in Q/V bands proposed by African countries (ATU)
 - Bands 37.5-42.5 GHz (space-to-Earth) and 42.5-43.5 GHz, 47.2-50.2 GHz and 50.4-51.4 GHz (Earth-to-space)

Chapter 2

Agenda item 1.7 IMT

Resolution 256 (WRC-23)

- Except 7 125-7 250 MHz, Europe opposed to study in these bands, due to no expectation of « nice » sharing solutions,
- The international dimension:
 - 4.4-4.8 GHz, 14.8-15.35 GHz and 7.25-7.75 GHz are intensively used by maritime and aeronautical receiving stations, *cf.* result of WRC-23 Agenda item 1.1, with stringent pfd limit at 20 km from the coast
 - 7.45-8.4 GHz with widespread earth stations for downloading EESS/Metsat observations + transmitting transportable earth stations + satellite reception.
- The protection of satellite in 7.9-8.4 GHz would be distinct from upper 6 GHz
 - Narrow spot beams: density of BS is an order of magnitude higher – law of large number not applicable (need to account for statistics of all parameters, not average)
 - Discussions on AAS antenna pattern and on clutter attenuation for directional antennas
- CEPT coordinators: Robert Cooper (UK, Ofcom) and Ines Ortega Castello (D, Airbus)

Chapter 2

Agenda item 1.10 Power flux-density / power limits

Resolution 775 (Rev. WRC-23)

- Usage of the band by the fixe service is widespread in 71 – 76 GHz / 81 – 86 GHz
- Some countries already licensed mobile applications in the band
- Challenge is to find the balance between protection of incumbent services and development of satellite applications, i.e. to protect incumbent services without undue or superfluous constraints on satellites
- CEPT coordinator: Nasarat Ali (UK, Ofcom)

Chapter 3

Agenda item 1.11 Space-to-space links

Resolution 249 (Rev. WRC-23)

- Proposal for space-to-space links in the 1.6 GHz/2.5 GHz frequency bands allocated to the MSS: covering the following bands allocated to the MSS: 1,518-1,544 MHz, 1,545-1,559 MHz, 1,610-1,645.5 MHz, 1,646.5-1,660 MHz, 1,670-1,675 MHz and 2,483.5-2,500 MHz.
- Similar to the work carried out under point 1.17 of WRC-23.
- The European proposal for ISLs for FSS space stations in the "core" C-band (3700-4200 MHz / 5925-6425 MHz) did not receive sufficient support, however, and was referred to WRC-31.

- CEPT coordinator: none yet

Chapter 3

Agenda item 1.12 MSS – Allocations for IoT development

Resolution 252 (WRC-23)

- MSS Low Data Rate (MSS LDR) proposal supported by Europe (CEPT) and Canada
- Bands 1,427-1,432 MHz (space-to-Earth), 1,645.5-1,646.5 MHz, 1,880-1,920 MHz and 2,010-2,025 MHz
- Alternative sharing framework to conventional framework (first-come, first-served mechanism) to be studied to meet demand for satellite IoT connectivity
- "Telephony" explicitly excluded from the scope of uses under study

- CEPT coordinator: Laura Pometcu (France, ANFR)

Chapter 3

Agenda item 1.13 MSS – IMT-space stations connectivity

Resolution 253 (WRC-23)

- Satellite component of IMT networks: NTN/D2D theme in mobile operator bands: response to projects such as Starlink, AST Space mobile and Lynk
 - Search for new MSS allocations for "direct connectivity" between space stations and "user equipment" to "complete the coverage of terrestrial IMT networks".
 - Bands concerned: 694-960 MHz, 1,427-1,518 MHz, 1,710-1,885 MHz, 1,885-2,025 MHz, 2,110-2,200 MHz, 2,300-2,400 MHz and 2,500-2,690 MHz.
- Studies to identify the conditions necessary to prevent any detrimental impact on terrestrial mobile networks
 - This work does not prejudge the necessary cooperative mechanisms between satellite and terrestrial operators.
 - Use of frequencies on a national basis to be strictly limited by terrestrial operators
- CEPT coordinator: none yet

Chapter 3

Agenda item 1.14 MSS – additional allocations

Resolution 254 (WRC-23)

- Generic MSS proposal at 2 GHz (S-band):
 - Bands 2,010-2,025 MHz (Earth-to-space) and 2,160-2,170 MHz (space-to-Earth) in Regions 1 and 3, and 2,120-2,160 MHz (space-to-Earth) in all Regions.
 - Uplink: the 2010-2025 MHz band, in common with the MSS LDR point, is considered for limited uplink use.
 - Downlink: little prospect of being able to use the bands in which IMT mobile network base stations (2 GHz band) transmit.
- Potential MSS services would be limited only in international waters, by nature to avoid coverage of land-based mobile operators
- CEPT coordinator: none yet

Chapter 4

Agenda item 1.16 Radio Quiet Zones

Resolution 681 (WRC-23)

- Agenda Item with 3 subjects
 - Definition of technical/regulatory measures to protect RAS from unwanted emissions of a single non-GSO system in 10.6-10.7GHz, 100-102 GHz, 130-134 GHz
 - Studies on aggregate interference from unwanted emissions of multiple non-GSO systems
 - Consideration of potential solutions to characterize Radio Quiet Zones in 2 radioastronomy sites: SKAO (Square Kilometre Array Observatory - South Africa) and ALMA (Atacama Large Millimeter/submillimeter Array -Chile). **Many questions are raised about what is the definition of a radio quiet zone.**
- CEPT coordinator: Gyula Jozsa (D, Max Planck Institute for Radio Astronomy)

Chapter 4

Agenda item 1.17 Space weather sensor protection

Resolution 682 (WRC-23)

- studies on spectrum needs and appropriate protection criteria for receive-only space weather sensors, to deal with potential new primary allocations to MetAids (space weather) in the following frequency bands for receive-only sensors:
 - 27.5-28.0 MHz;
 - 29.7-30.2 MHz;
 - 32.2-32.6 MHz;
 - 37.5-38.325 MHz;
 - 73.0-74.6 MHz;
 - 608-614 MHz;
- Space weather sensor is an important application that would contribute to provide space to Earth propagation conditions
- CEPT coordinator: Bharat Dudhia (UK, Ofcom)

Chapter 4

Agenda item 1.18 Earth exploration service protection

Resolution 712 (WRC-23)

- compatibility studies between the EESS (passive) and the corresponding active services in adjacent frequency bands above 76 GHz
- modification of Resolution 750 on protection of EESS from unwanted emissions of active systems would be considered.
- CEPT coordinator for resolves 1 related to EESS: Philippe Tristant (France, EUMETSAT)

Chapter 4

Agenda item 1.19 Earth exploration-satellite service allocation

Resolution 674 (WRC-23)

- possibility of a future allocation to the EESS (passive) in the frequency bands 4 200-4 400 MHz and 8 400-8 500 MHz
- The main current frequency band used for sea surface temperature measurement is in the upper 6 GHz that in the future would be impacted by RLAN and IMT
- Consequently, the new complementary allocation to EESS (passive) in the two identified bands would be required

- CEPT coordinator: Thibaut Caillet (France, ANFR)

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