



International Telecommunication Union (ITU)

**The Radiocommunication Assembly (RA-23) and
the World Radiocommunication Conference (WRC-23),
*Results and Future Agenda***

Technical Presentation

61st session of the Scientific and Technical Subcommittee
of the Committee on the Peaceful Uses of Outer Space

2 February 2024



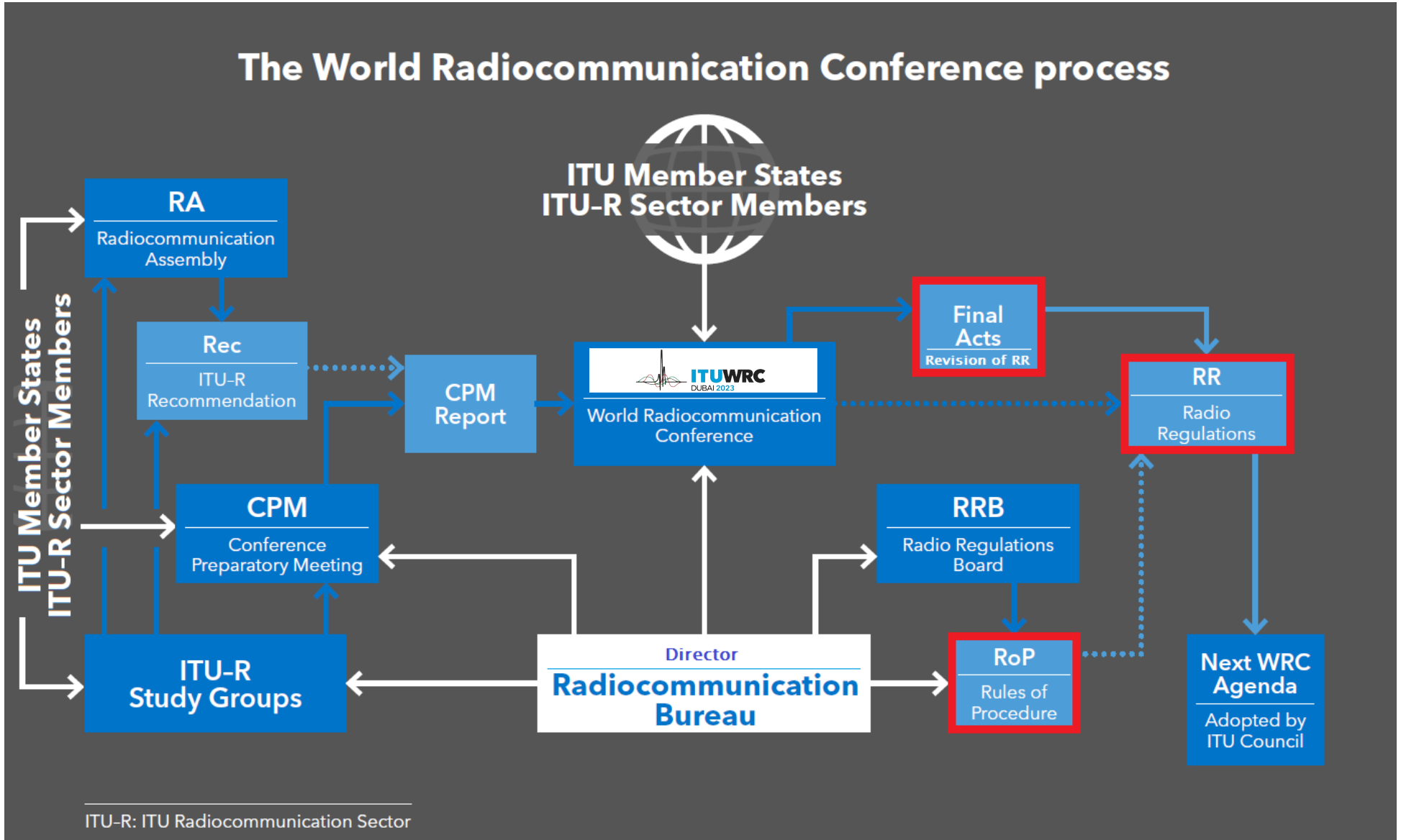
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The World Radiocommunication Conference process



The last 4-year study cycle ended in Dubai, United Arab Emirates, with :

The ITU
Radiocommunication
Assembly, RA-23

The ITU
World Radiocommunication
Conference, WRC-23

WRC-23
Provisional Final Acts
with WRC-27 agenda

The ITU
Conference
Preparatory
Meeting



CPM-1 2027

18-19 December 2023

New study
cycle starts...

163 Member States and Sector Members

~3900 Delegates





RA-23 Resolution ITU-R 74

on Activities related to the sustainable use of radio-frequency spectrum and associated satellite-orbit resources used by space services.

It recognizes the mandate and work of the COPUOS and the importance of not duplicating work already being done elsewhere in the UN system.

The Resolution emphasises the continuation of technical activities, including those on radio interference assessment and mitigation techniques among non-GSO systems in support of long-term sustainability in the scope of ITU-R, taking into account the special needs of the developing countries and the geographical situation of particular countries.

Actions:

- to develop a **Handbook** on best practices for the sustainable use of frequencies and associated non-GSO orbits,
- to develop a new **Recommendation** providing guidance on safe and efficient deorbit and/or disposal for non-GSO focusing on the spectrum/orbits resources,
- to create a **website**, containing links to information on the subjects in resolves 2 of this Resolution,
- to **collaborate and exchange** information with other UN organizations dealing with space activities, as well as with UNOOSA and COPUOS.



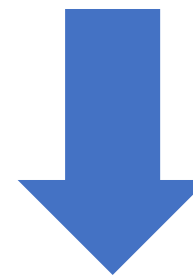
WRC-23 decisions on:

19 agenda items (1.1 to 1.19) for the amendment of the Radio Regulations about terrestrial, maritime, aeronautical, sciences radio services;

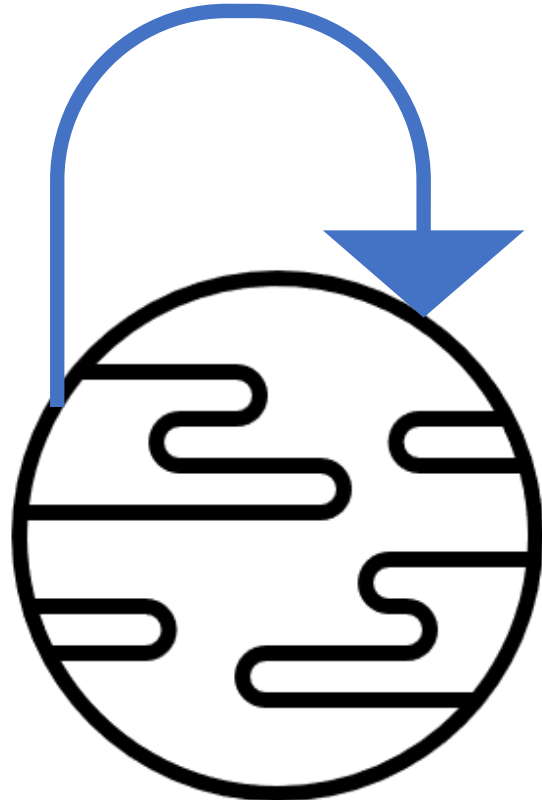
11 topics under a.i 7 for improvement of procedures;

4 topics under a.i 9.1 studied during the cycle.

Some agenda items are particularly related to the work of the Committee of Peaceful Use of Outer Space (COPUOS) and its Sub-Committees.



WRC-23 decision on sub-orbital vehicles:



WRC-23 agenda item 1.6:

1. The ITU-R was invited to study the spectrum needs to accommodate radio stations (“stations”) on board sub-orbital vehicles to facilitate radiocommunications that support aviation to safely integrate sub-orbital vehicles into airspace and to ensure interoperability with international civil aviation.
2. From the three Methods proposed, **the Conference decided not to modify the Radio Regulations**, to abrogate Resolution 772 (WRC-19) and not to reconvene the subject on the agenda of the next WRC in 2027.

Radio Regulations No **1.61** defines a station as, *“One or more transmitters or receivers or a combination of transmitters and receivers, including the accessory equipment, necessary at one location for carrying on a radiocommunication service, or the radio astronomy service.”*

WRC-23 decisions on radio services for science:

WRC-23 agenda item 1.12

The Conference decided on a new secondary allocation to the Earth exploration-satellite service (EESS) (active) for **spaceborne radar sounders** in the range of frequencies around 45 MHz on the Polar regions.



WRC-23 agenda item 1.13

For **transmitting future scientific data at high data transmission speeds**, the Conference decided to upgrade the allocation to the space research service on a primary basis for satellite systems operating in the space-to-space, space-to-Earth and Earth-to-space directions at distances from the Earth of less than 2×10^6 km in the frequency band 14.8 to 15.35 GHz.



WRC-23 agenda item 1.14

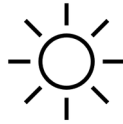
The Conference decided to allocate the new primary frequency allocation to the EESS (passive) in the frequency bands 239.2-242.2 GHz and 244.2-247.2 GHz, to ensure **alignment with more up-to-date remote sensing observation requirements, mainly Ice Cloud Measurements and atmosphere gases measurement.**



WRC-23 decisions on radio services for science (cont.):

WRC-23 agenda item 9.1-a:

Space Weather Observation Sensors



The Conference decided to add a new Article 29B in the Radio Regulations. A new Resolution *resolves* that the following definition for space weather shall be used:

space weather: natural phenomena, mainly originating from solar activity and occurring beyond the major portion of the Earth's atmosphere, that impact Earth's environment and human activities.

Studies will continue for WRC-27.

WRC-23 agenda item 9.1-d:

Protection of EESS (passive) from non-GSO FSS space stations.

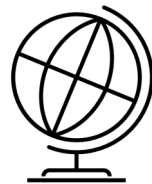


To protect EESS in 36-37 GHz, the Conference decided that non-GSO systems in the fixed-satellite service operating with an apogee altitude above 407 km and below 2'000 km shall not exceed an unwanted emission e.i.r.p. density of -21 dB(W/100 MHz) per space station for angles greater than 65.0° from nadir relative to the space station.

WRC-23 decisions on equitable access to radio spectrum/orbits resources:



About the **Resolution 559** (WRC-19), the Conference endorsed the successful application of the special procedure by **41 national Administrations to regain spectrum and orbital resources in the** broadcasting satellite services **Plan**.



WRC-23 agenda item 7 Topics D, E, F, H and I:

Improvement of efficiency and long-term protection of **Space Plans** for equitable access to the geostationary orbit (GSO) in the fixed or broadcasting satellite services.

WRC-23 agenda item 7 Topic K:

Review of the **special procedure** for enhancement of equitable access to broadcasting-satellite networks in the frequency band 21.14-22 GHz in ITU Regions 1 and 3 (Resolution 553).

WRC-23 other decisions:

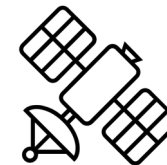
WRC-23 agenda item 7 Topics A and B:

The Conference decided to add constraints on the non-geostationary orbit (non-GSO) constellations orbital tolerance and post-milestone deployment.



The Conference made decisions on **other agenda items** related to space services, such as:

- new aeronautical mobile-satellite service (AMS(R)S) allocation in the VHF range to complement the existing terrestrial aeronautical system,
- harmonization of use of spectrum and new communication for Earth Stations In Motion (ESIMs),
- inter-satellite links allocation,
- Etc.



What is next in the agenda for the 2023-2027 study cycle?

- **WRC-27 agenda item 1.5** to consider regulatory measures, and implementability thereof, to limit the **unauthorized operations of non-geostationary-satellite** orbit earth stations in the fixed-satellite and mobile-satellite services and associated issues related to the service area of non-geostationary-satellite orbit satellite systems in the fixed-satellite and mobile-satellite services.
- **WRC-27 agenda item 1.6** to consider technical and regulatory measures for fixed-satellite service satellite networks/systems in the frequency bands 37.5-42.5 GHz (space-to-Earth), 42.5-43.5 GHz (Earth-to-space), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space) for **equitable access to these frequency bands**.
- **WRC-27 agenda item 1.15** to consider studies on frequency-related matters, including possible new or modified space research service (space-to-space) allocations, for future development of **communications on the lunar surface and between lunar orbit and the lunar surface**.
- **WRC-27 agenda item 1.16** to consider studies on the technical and regulatory provisions necessary to **protect radio astronomy operating in specific Radio Quiet Zones** and, in frequency bands allocated to the radio astronomy service on a primary basis globally, from aggregate radio-frequency interference caused by non-geostationary-satellite orbit systems.
- **WRC-27 agenda item 1.17** to consider regulatory provisions for receive-only **space weather sensors** and their protection in the Radio Regulations, taking into account the results of ITU Radiocommunication Sector studies.
- **WRC-27 agenda item 1.18** to consider, based on the results of ITU Radiocommunication Sector studies, possible regulatory measures regarding the **protection of the Earth exploration-satellite service (passive) and the radio astronomy service** in certain frequency bands above 76 GHz from unwanted emissions of active services.



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In summary,

Activities in outer space require more spectrum and orbits sharing.

Most of the WRC-27 topics are related to space radio services and the use of spectrum from Earth orbits and on the Moon.

COPUOS and Subcommittee Members are encouraged to follow and stay informed about the regulatory and technical work progress of the ITU-R study through the 4-years of the WRC mechanism. The ITU will continue to actively liaise during the COPUOS and Sub-Committees session.





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References:

RA-23 Documents: <https://www.itu.int/ra-23/documents/>

WRC-23 Documents: <https://www.itu.int/wrc-23/documents/>

ITU-R Study Groups: <https://www.itu.int/en/ITU-R/study-groups/Pages/default.aspx>

COPUOS-STSC 61 (2024): CRP by ITU on the results of the WRC-23