



**ICAO AFI Workshop for the 2023 ITU World Radiocommunication
Conference
Virtual, 26 -27 April 2022**

ITU Preparatory process towards WRC-23

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International Telecommunication Union

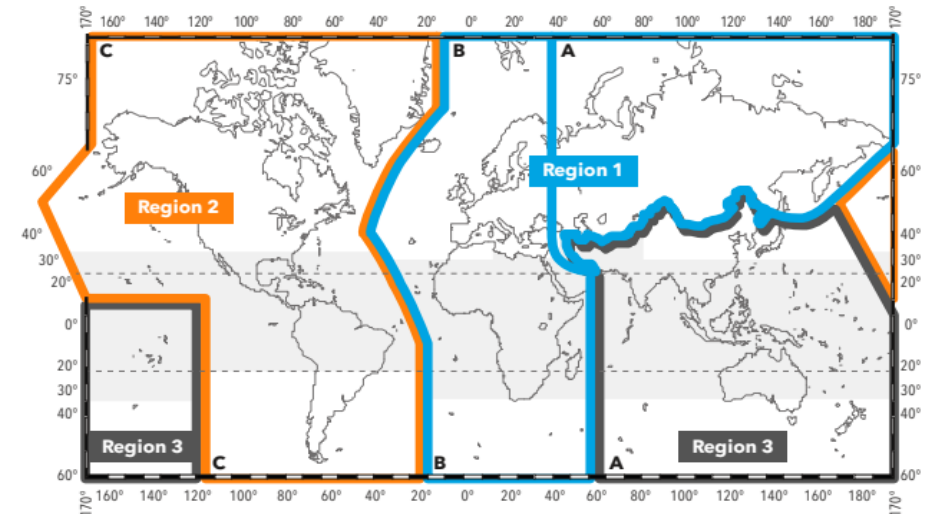
- Based in Geneva, 193 Member states, 750 private-sector entities and academic institutions, 12 regional and area offices
- 800 staff from 85 countries, 6 official languages
- 3 ITU Sector:
 - **ITU-R Radiocommunications** – *spectrum management, radio standards*
 - **ITU-T Standardization** – *standards for wired networks*
 - **ITU-D Development** – *assistance to developing countries*
- The basic ITU document dealing with radio is **Radio Regulations**





Radio Regulations (RR)

- RR - international rules for use of spectrum and satellite orbits
- RR - intergovernmental treaty: mandatory
- Define the rights and obligations of ITU Member States on use of spectrum/orbit resources.
- Main goals of the RR:
 - interference free operation of stations
 - harmonization of spectrum spectrum/orbit use
- RR updated every 3-4 years by World Radiocommunication Conferences - WRCs

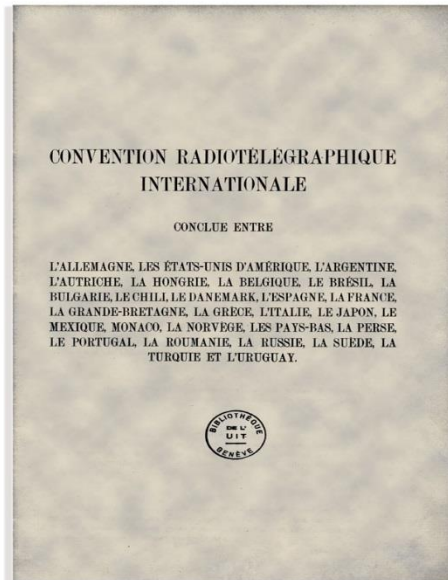




History of Radio Regulations

1906

2022



From the first International Radiotelegraph Convention, **1906** to the Radio Regulations, **2020**

RR follow and anticipate technological advancements





Between 1906 and 2019

IRTC-1906

10 days
120 participants
30 countries

WRC-19

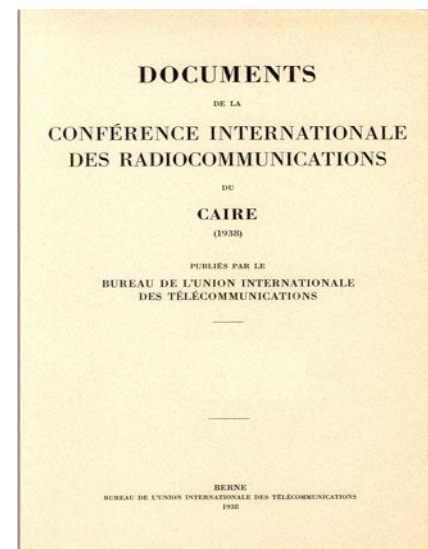
4 weeks
3 420 participants
163 countries, 129 other entities





Allocations of aeronautical bands at WRCs

1927, Washington	First definitions of aeronautical and aircraft stations, allocations to aeronautical mobile service in LF and MF bands, e.g. 315 – 350 kHz
1938, Cairo	Exclusive allocations to HF aeronautical services between 6500 and 23380 kHz
1947, Atlantic City	Allocations of 108 – 118 MHz for ARNS and 118 – 132 MHz to the aeronautical mobile service
1963, Geneva	First Conference dealing with satellite issues. Allocation of frequency bands for communication-satellite and <u>radionavigation</u> -satellite services
1959/1964/1966, Geneva	Establishment and revision of the allotment plan for HF aeronautical mobile (R) service
1971, Geneva	Introduction of the aeronautical mobile-satellite service and allocations to it in 1.5/1.6 GHz band. Allocation of 406 – 406.1 to Cospas-Sarsat
....
2015, Geneva	Allocation of spectrum for WAIC, GFT



Delegates at the 1947 Atlantic City Radio Conference



Role of WRCs

- Allocate spectrum/orbit resource for emerging radio applications, while protecting the existing usage (e.g. *new HAPS in millimeter bands <-> existing FS, MS*)
- Maintain the right balance between the spectrum requirements of all radiocommunication services, including aeronautical services (*justified and reasonable spectrum requirements*)
- Achieve global interoperability of the equipment and spectrum harmonization for economies of scale (e.g. *maritime, aeronautical, IMT*)
- Create regulatory certainty for users, regulators and telecommunication industry in utilizing spectrum



WRC-23 preparation milestones





Important steps of WRC process

- **Agenda** – determines the scope of discussions
 - Agenda is important, stable. It has a legal notion
 - Agenda Item 1.2 “IMT in mid-bands” lists 5 candidate bands → no other bands can be allocated
- **ITU-R Studies**- heart of WRC preparations
 - Task is to satisfy spectrum requirement of emerging applications while protecting existing ones
 - Making sure that all interference scenarios are analysed and cleared to keep interference within manageable limits under all circumstances
- **WRC** – allocates bands and establishes operational conditions for newly allocated services
 - A treaty making Conference, so the final say remains with Member States (telecom regulators)



Agenda items of WRC-23

Fixed, Mobile, Broadcasting

1.1 - 1.3: MS in 3.3-10.5 GHz

1.4: HIBS below 2.7 GHz

1.5: MS, BS in UHF, R1

Satellite science services

1.12: space radar sounders 45 MHz

1.13: space research service in 14.8-15.35 GHz

1.14: Remote-sensing observation requirements in 231.5-252 GHz

WRC-23 agenda

Aeronautical, Maritime

1.6: Sub-orbital vehicles

1.7: AMS(R)S VHF allocation

1.8: UAS CNPC links via FSS

1.9: HF AM(R)S , App.27

1.10: non-safety AMS in 15, 22 GHz

1.11:GMDSS modernization

Space services

1.15: Ku ESIMs , GSO

1.16: Ka ESIM, NGSO

1.17 intersatellite links

1.18: NB MSS for IoT, L/S-bands

1.19: Ka FSS in R2

7: Satellite regulatory issues



ITU-R studies

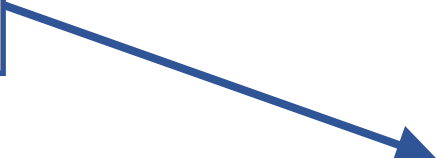
- The first session of CPM defined :
 - Framework for WRC-23 preparations
 - Structure of draft CPM Report
 - Responsible ITU-R Groups and Concerned Groups. The main Groups: WG5B and 4A
 - There are: 19 specific and 11 standing items, see [Res. 811 \(WRC-19\)](#).
- The main aeronautical agenda items are:
 - 1.6: Regulations for sub-orbital vehicles
 - 1.7: VHF allocation for AMS(R)S
 - 1.8: Regulations for UAS CNPC links via FSS
 - 1.9: Introduction of digital technologies for HF AM(R)S in RR Appendix 27
 - 1.10: allocations for non-safety AMS in 15.5 and 22 GHz



Timetable towards WRC-23

Situation as of today

[Website WRC-23 – World Radiocommunication Conferences \(WRC\) \(itu.int\)](https://www.itu.int/wrc-23)



Year	January – March	April – June	July – September	October – December
2022	<p>WP 5D (8th)</p> <p>TG 6/1 (4th)</p> <p>[WP 5B (5th)]</p>	<p>[WPs 7B & 7C (5th)]</p> <p>[WP 4C+WP 4A (6th)]</p> <p>[WPs 5A & 5C (5th)]</p> <p>[WP 5D (9th)]</p> <p>[5D-WG Spectrum]</p>	<p>[WP 5B (6th)]</p> <p>[TG 6/1 (5th)]</p> <p>[WP 4C+WP 4A (7th)]</p> <p>[WPs 7B & 7C (6th)]</p> <p>[WP 5D (10th)]</p>	<p>[WPs 5A, 5C (6rd) & 5B (7th)]</p> <p>[CPM-23 Manag^{nt} Team]</p> <p>[2nd WS on WRC-23]</p>
2023	<p>[Meetings of the Responsible Groups]</p>	<p>[CPM23-2]</p>	<p>[Last meetings of the Responsible Groups]</p> <p>[3rd WS on WRC-23]</p>	<p>RA-23</p> <p>WRC-23</p>



Structure of draft CPM Report to WRC-23

<u>Chapters of the draft CPM Report</u>	<u>WRC-23 agenda items</u>
1. Fixed, Mobile and Broadcasting issues	1.1, 1.2, 1.3, 1.4, 1.5
2. Aeronautical and maritime issues	1.6, 1.7, 1.8, 1.9, 1.10, 1.11
3. Science issues	1.12, 1.13, 1.14
4. Satellite issues	1.15, 1.16, 1.17, 1.18, 1.19, 7
5. General issues	2, 4, 9.1 topics a), b), c), d)
Annex 1	Information on WRC-23 agenda item 10 (WRC-27 preliminary agenda items)



WRC preparations. Level 1 – national activities

- National preparations – starting point in WRCs process. Country activities result in adopting a national position for WRC, which is further tuned in regional and international discussions
- Regulator has to keep a balance between different applications to respond to the needs of the population and national objectives
- Aviation needs to actively participate in development of national positions. To protect the existing usage and satisfy its future requirements
- It is necessary to pay attention to both in-band and adjacent band protection of aeronautical services



Level 2 - Regional preparations

- The role of the 6 Regional Telecommunication Organizations is constantly growing, both before and during WRCs. Your region: African Telecommunication Union – 48 countries
- They consolidate views at regional level, assist in interregional discussions, facilitate reaching a common understanding, save time during WRCs (6 views instead of 193)
- WRC-19: two thirds of documents were common proposals
- ITU Radiocommunication Bureau facilitates coordination between regions by organizing ITU Inter-regional Workshops



Asia-Pacific
Telecommunity (APT)



Arab Spectrum
Management Group
(ASMG)



African
Telecommunications
Union (ATU)



European Conference of Postal
and Telecommunications
Administrations (CEPT)



Inter-American
Telecommunication
Commission (CITEL)



Regional Commonwealth
in the Field of
Communications (RCC)

3rd African Preparatory meeting for WRC-23 (APM23-3) – from 5 to 9 September 2022, Lusaka, ZMB



ITU Interregional workshops on WRC-19

1st Workshop: 13 – 15 December 2021

Presentation and review of the on-going preparatory studies of the ITU-R responsible groups for CPM-23

Presentation of regional groups, international organizations like ICAO, IMO, WMO on their positions

2nd Work shop: 30 November – 2 December 2022

Presentation of the Draft CPM Report to WRC-23 (explanation of the draft Methods)

Presentation of regional groups, international organizations on positions & common proposals for CPM-2

3rd Workshop: Q3/Q4 2023

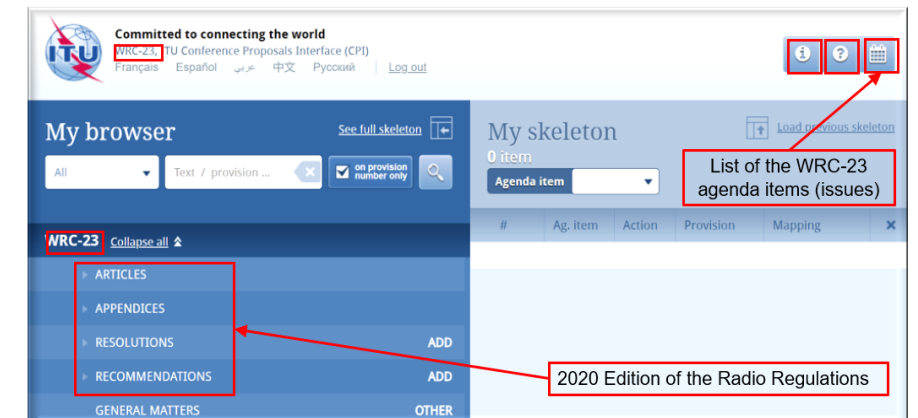
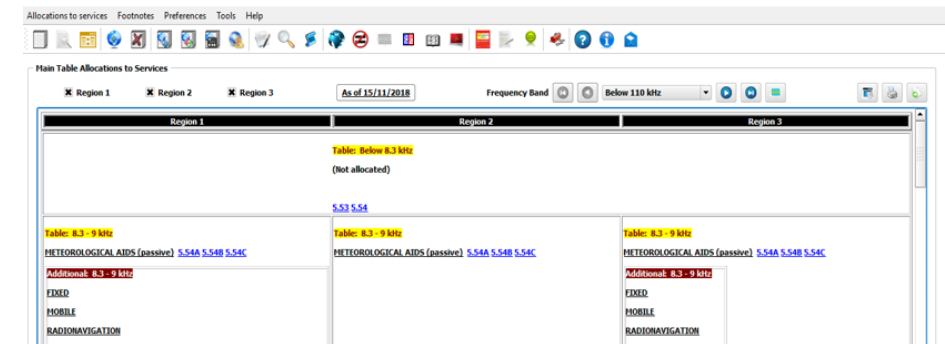
Presentation of CPM & Director's Reports to WRC-23

Presentation of regional groups, international organizations on positions, common proposals to WRC-23



Some ITU/BR tools for WRC preparations

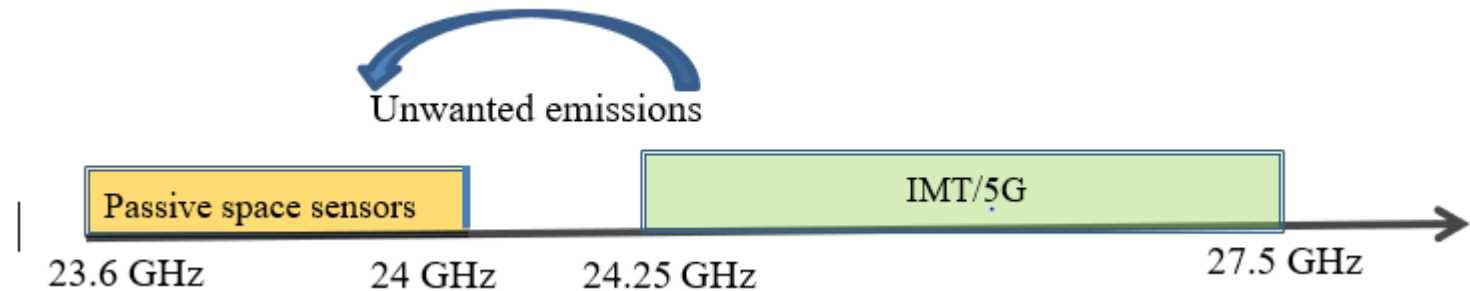
- **RR Navigation tool** – allows navigation of all Radio Regulations, Rules of Procedure, ITU-R Recommendations mentioned in RR, ITU Constitution and Convention, PP Resolutions.
www.itu.int/pub/R-REG-RRX-2021
- **RR Article 5 Viewer** – useful for extracting national footnotes, historical comparison of RR, simultaneous analysis of RR, Rules of Procedure, WRC Resolutions and ITU-R recommendations
www.itu.int/pub/R-REG-RR5-2020
- **Conference Proposals Interface for WRC-23** – to be used for for preparation of draft documents with proposed actions
www.itu.int/net4/proposals/CPI/WRC23





Adjacent band issues

- **Past** : almost no analysis of adjacent bands interference for new allocations at WRC. Examples:
 - **no** RR provisions for compatibility of FM radio < 108 MHz and aeronautical navigation > 108 MHz
 - **no** RR provisions for compatibility of IMT < 1 518 MHz and MSS terminals > 1 518 MHz
- **Present**: more and more studies for new allocations include adjacent band compatibility. WRC-23:
 - New frequencies for 5G in mid-bands (3300-3400, 3600-3800, 6425-7125, 10.0-10.5 GHz)
 - New frequencies for HAPS below 2.7 GHz
- **Good example**: WRC-19 ensured protection of space sensors from 5G in 24 GHz
 - established unwanted emission limits on 5G stations to protect sensors below 24 GHz
 - The limits are in Res 750 (Rev.WRC-19), implemented in 2 phases, more stringent after 2027





T h a n k y o u !



Overlapping frequency bands between some WRC-23 agenda items

1.2 (IMT) WP 5D	1.4 (HIBS) WP 5D	1.16 (non-GSO FSS ESIMs) WP 4A	1.17 (ISL) WP 4A	1.18 (narrowband MSS) WP 4C
	2 010-2 025 MHz (Regions 1 & 3)			2 010-2 025 MHz (Region 1)
3 300-3 400 MHz (Regions 1 & 2)				3 300-3 315 MHz 3 385-3 400 MHz (Region 2)
		27.5-29.1 GHz (E-s) 29.5-30 GHz (E-s)	27.5-30 GHz (s-s)	

* E-s: Earth-to-space; s-s: space-to-space.