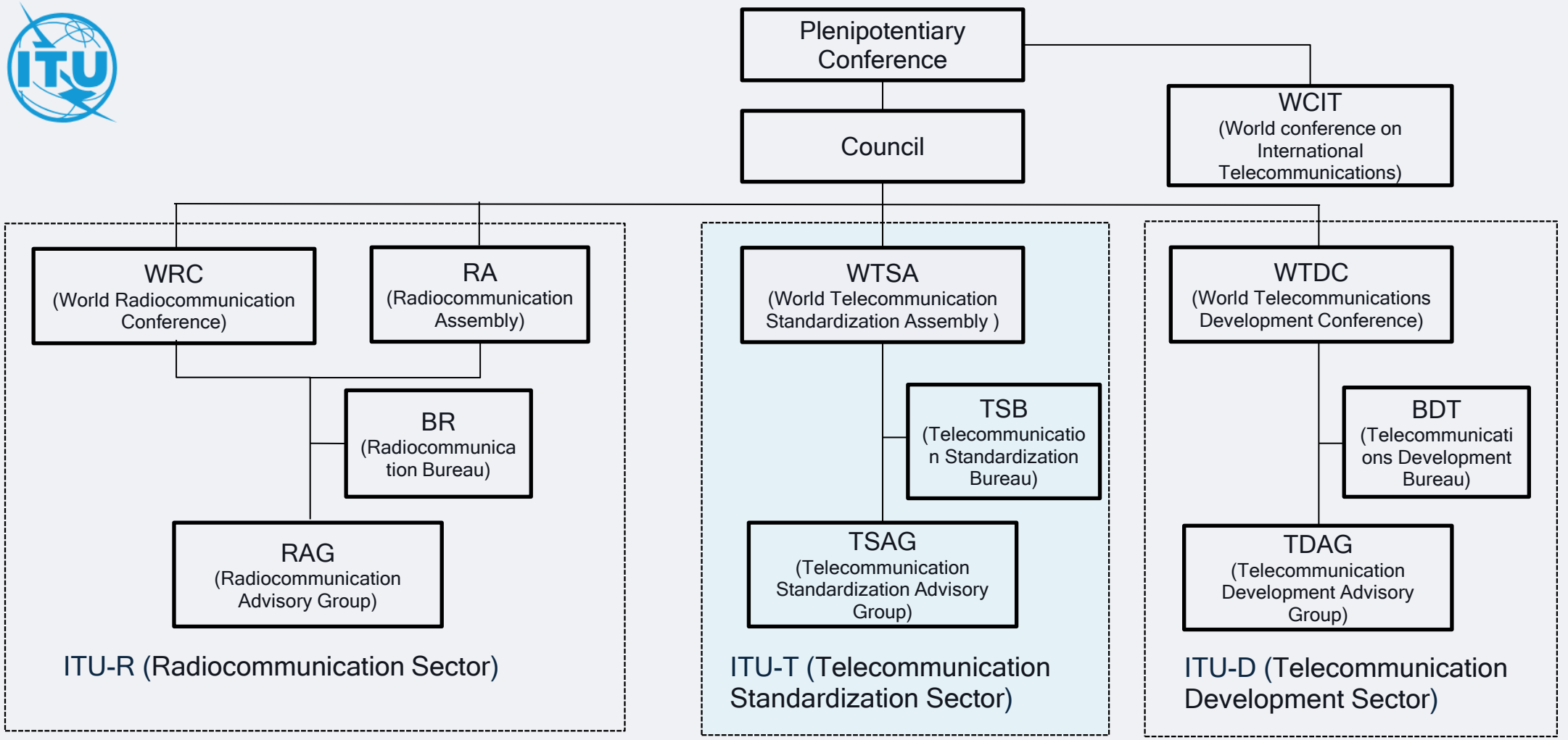
ITU Overview

ITU Overview (Structure)



ITU-D

ITU-D Event | WTDC | General Overview

Sets the overall direction and structure for ITU-D, in every 4 years

WTDC14 Dubai, UAE

WTDC17, Buenos Aires, Argentina

WTDC22 Kigali, Rwanda (6-16 June 2022)

- Draws up ITU-D **Action Plan** and **Mandate**
- Establishes **ITU-D Study Groups** and approves **top priorities**, **questions** and **work programme**

WTDC serve as forums for discussion by all concerned with the Development Sector, review the numerous programmes and projects. Results are reported and new projects are launched.

WTDC-22 | Conference Structure

Committe 1: Steering Committee

- Coordination all matters connected with the smooth execution of work
- Planning the order of meetings

Committe 2: Budget Control

- Conference expenses
- Estimation of financial needs of ITU-D up to the next WTDC
- Costs entailed by the execution of the decisions taken by the Conference

Committe 3: Objectives

- SG Questions
- Regional Initiatives
- Resolutions

Committe 4: ITU-D Working Methods

- Working methods of the ITU-D SGs and TDAG
- Programme delivery

Committe 5: Editorial Committee

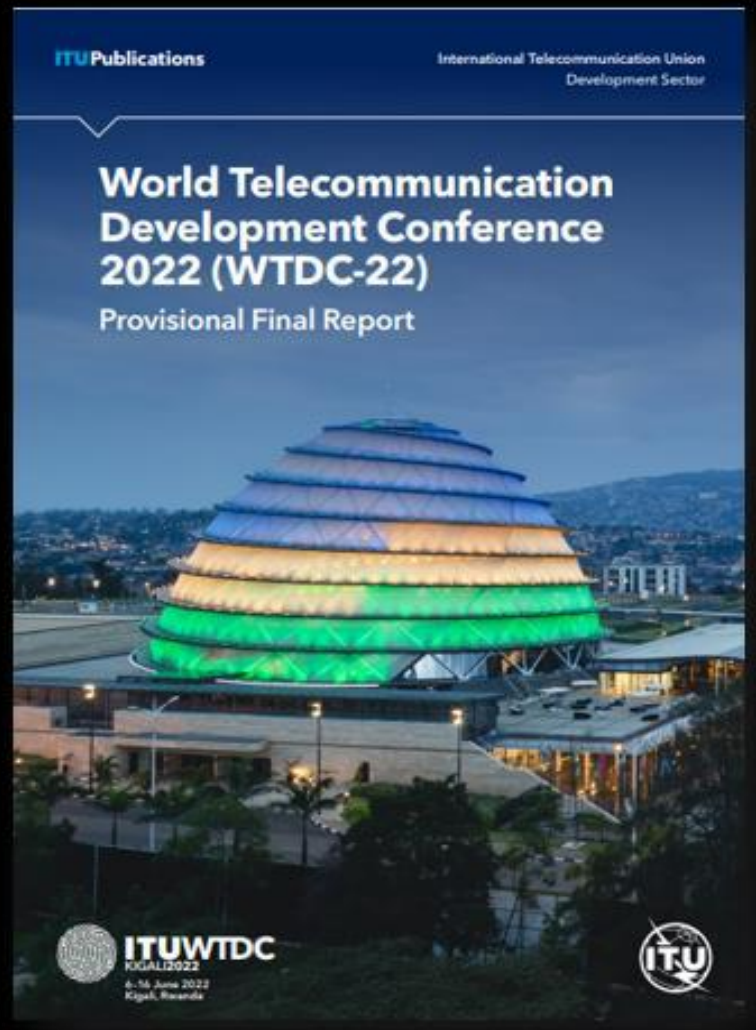
- Text alignment in the official languages of the Union

Working Group of Plenary

- WTDC Declaration
- ITU-D input to the Union's strategic plan (to be adopted at the next PP)

Confidential - Qualcomm Technologies, Inc. and/or its affiliated companies - May Contain Trade Secrets

WTDC-22 | Main Outputs



Kigali Action Plan

ITU-D Priorities	• Five priorities that will support the achievement of the ITU Strategic Plan 2024-2027
Regional Initiatives	• New and updated Initiatives for the 6 Regions
Resolutions	• 40 revised Resolutions • 4 new Resolutions
Study Group Questions	• 2 Study Groups: SG1 & SG2 • 12 revised Questions, 2 new Questions

WTDC-22 | Kigali Action Plan | ITU-D Priorities

The Kigali Action Plan identified five ITU-D priorities that will support the achievement of the ITU Strategic Plan 2024-2027.

- Affordable Connectivity
- Digital Transformation
- Enabling Policy and Regulatory Environment
- Resource Mobilization and International Cooperation
- Inclusive and secure telecommunications/ICTs for sustainable development

Confidential - Qualcomm Technologies, Inc. and/or its affiliated companies - May Contain Trade Secrets

WTDC-22 | Kigali Action Plan | ITU-D SG Questions

During WTDC-22, the scope of ITU-D study groups has been revised. The revised and new Questions fall under two main categories:

Study Group 1 *Enabling environment for meaningful connectivity*

- Q1/1 Strategies and policies for the deployment of broadband in developing countries
- Q2/1 Strategies, policies, regulations and methods of migration to and adoption of digital technologies for broadcasting, including to provide new services for various environments
- New — Q3/1 The use of telecommunications/ICTs for disaster risk reduction and management
- Q4/1 Economic aspects of national telecommunications/ICTs
- Q5/1 Telecommunications/ICTs for rural and remote areas
- Q6/1 Consumer information, protection and rights
- Q7/1 Telecommunication/ICT accessibility to enable inclusive communication, especially for persons with disabilities.

Study Group 2 *Digital transformation*

- Q1/2 Sustainable smart cities and communities
- Q2/2 Enabling technologies for e-services and applications, including e-health and e-education
- Q3/2 Securing information and communication networks: Best practices for developing a culture of cybersecurity
- Q4/2 Telecommunication/ICT equipment: Conformance and interoperability, combating counterfeiting and theft of mobile devices
- New — Q5/2 Adoption of telecommunications/ICTs and improving digital skills
- Q6/2 ICTs for the environment
- Q7/2 Strategies and policies concerning human exposure to electromagnetic fields.

ITU-T

Overview of WTSA

- The World Telecommunication Standardization Assembly is held every four years and defines the next period of study for ITU-T. WTSA is a **non-treaty-level** conference. However, the approved recommendations and resolutions shape the ITU-T's future. They can pave the way for a much more expansive role beyond ICTs and telecommunications, including work items related to new and emerging technologies.
- The World Telecommunication Standardization Assembly (WTSA-24) will define the senior leadership team, work program, working methods and structure of Study Groups for the ITU Telecommunication Standardization Sector (ITU-T) for the 2024-2027 study period
- The activities of WTSA are outlined under Article 13 of the ITU Convention. During WTSA governments will:
  - Decide whether or not to approve draft Recommendations submitted by the Study Groups;
  - Consider proposals to retain, dissolve or merge study groups and their Questions;
  - Consider proposals to add new Study Groups and Questions that reflect new issues or priorities;
  - Consider whether to add, merge, retain or dissolve other groups;
  - Agree on the mandate, scope and terms of reference for Study Group work programs (found in WTSA Resolution 2);
  - Review previous WTSA Resolutions for modification or deletion and consider Member State proposals for new Resolutions;
  - Elect Chairs and Vice-Chairs of the Study Groups; and
  - Consider other policy matters.

Expected New Resolution Proposals in WTSA-24

AI (focusing on Safety and Trustworthiness)

APT

RCC (a big package)

Metaverse

APT,ATU, CEPT, CITEL, RCC

Post-Quantum Cryptography

APT

Vehicular Communication

APT

Sustainable digital transformation

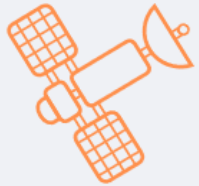
APT, ATU,AST

Digital Public Infrastructure (DPI)

ATU, AST

Digital Identities and Credentials

APT



NGSO LEO satellite networks

ATU

Strategic planning

ATU, AST

Youth engagement

APT

OTTServices

ATU, AST

Handset-derived emergency caller location information

CEPT

ITU-T TSAG and Study Groups

- SG2 : Operational aspects of service provision and telecommunication management
- SG3: Tariff and accounting principles and international telecommunication/ICT economic and policy issues
- SG5 : EMF, environment, climate action, sustainable digitalization, and circular economy
- SG9: Broadband cable and TV
- SG11: Protocols, testing & combating counterfeiting ← Interoperability test and combat counterfeting
- SG12: Performance, quality of service (QoS) and quality of experience (QoE)
- SG13: Future Networks and emerging network technologies ← Potential SG for O-RAN transposition
- SG15: Networks, technologies and infrastructures for transport, access and home ← Multimedia
- SG16: Multimedia & related digital technologies ← Multimedia
- SG17: Security
- SG20: Internet of things (IoT) and smart cities and communities (SC&C) ← OneM2M transition

Total 11 SGs and they are subject to the restructure in WTSA in Q4 of 2024.

ITU-T Focus Groups

These groups serve as an alternative working environment to augment the Study Group work by rapidly developing specifications in specific areas. They have the freedom to organize themselves, choose their working methods, leadership, financing and types of deliverables.

- FG-MV: Metaverse (in operation since 2022 December)
- FG-CD: Cost models for affordable data services (in operation since 2023 March)
- FG-TBFxG: Testbeds Federations for IMT-2020 and beyond (in operation since 2021 December)
- FG-AI4A: Artificial Intelligence (AI) and Internet of Things (IoT) for Digital Agriculture (in operation since 2021 October)
- FG-AI4NDM: Natural Disaster Management (in operation since 2020 December)
- FG-AN : Autonomous Networks (in operation since 2020 December)
- FGAI4H: Artificial Intelligence for health (in operation since 2018)

ITU-T Focus Groups (Cont.)

- FG-AI4AD: AI for autonomous and assisted driving (2019-2022)
- FG-QIT4N: Quantum Information Technology for Networks (2019-2021)
- FG-AI4EE: Environmental Efficiency for Artificial Intelligence and other Emerging Technologies (2019-2022)
- FG-VM: Vehicular Multimedia (2018-2022)
- FG-NET2030: Technologies for Network 2030 (2018-2020)
- FG-ML5G: Machine Learning for Future Networks including 5G (2018-2020)

**List of Focus Groups that completed their activities (in chronological order) (itu.int)

ITU-R

ITU-R Study Groups

The work of the Study Groups is governed by the **ITU-R Resolutions**, in particular Resolution ITU-R 1, **ITU-R Questions** and **WRC agenda items** requesting preparatory studies.

The studies are **driven by contributions** from the ITU-R Sector Membership.

Each Study Group **carries out studies**, adopting Recommendations and Questions, as well as approving Reports, Decisions, Opinions and Handbooks, on **radiocommunication matters under its mandate**.

These studies are the **technical, operational and procedural basis for decisions taken at WRCs** and for efficient use of the radio spectrum and the geostationary-satellite orbit.

ITU-R Study Groups and their Working Parties

SG 1	WP 1A	Spectrum engineering techniques
	WP 1B	Spectrum economic approaches
	WP 1C	Spectrum monitoring
SG 3	WP 3J	Propagation fundamentals
	WP 3K	Point-to-area propagation
	WP 3L	Ionospheric propagation and radio noise
	WP 3M	Point-to-point and Earth-space propagation
SG 4	WP 4A	Efficient orbit/satellite utilization for FSS and BSS
	WP 4B	Systems, air interfaces, performance and availability objectives for FSS, BSS & MSS
	WP 4C	Efficient orbit/satellite utilization for MSS and RDSS
SG 5	WP 5A	Land mobile, fixed, amateur and amateur-satellite services
	WP 5B	Maritime and aeronautical mobile services and radiodetermination
	WP 5C	HF and systems in the fixed and land mobile services
	WP 5D	IMT systems
SG 6	WP 6A	Terrestrial broadcasting delivery
	WP 6B	Broadcast service assembly and access
	WP 6C	Programme production and quality assessment
	TG 6/1	WRC-23 agenda item 1.5
SG 7	WP 7A	Time signals and frequency standard emissions
	WP 7B	Space radiocommunication applications & research, meteorological satellite, etc.
	WP 7C	Remote sensing systems: Earth exploration, space weather sensors, etc.
	WP 7D	Radio astronomy
CCV	Coordination Committee for Vocabulary	

ITUWRS GENEVA2022

Brief about WRC-23

World Radiocommunication Conference

Review the Radio Regulations

WRC is held every three to four years to review, and, if necessary, revise the Radio Regulations, the international treaty governing the use of the radio-frequency spectrum and the geostationary-satellite and non-geostationary-satellite orbits.

WRC-23

Held from 20 November to 15 December 2023 in the Dubai World Trade Centre, Dubai, United Arab Emirates.

Bring together all stakeholders in a process that is aimed at building consensus

WRC-23 had around 3900 delegates from 163 Member States including 88 ministerial-level participants and 141 Sector Members.

Enable new radiocommunication systems and application to access the radio spectrum

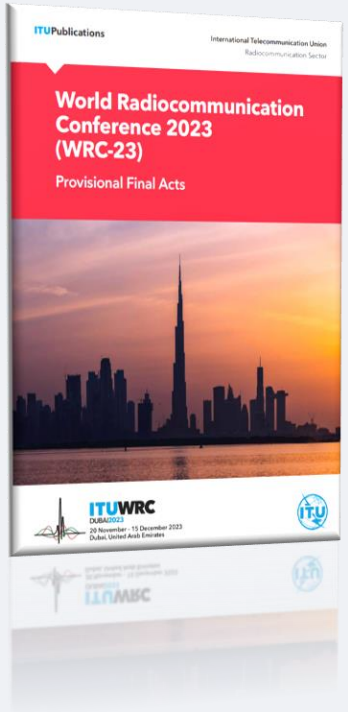
For mobile, referred to at the ITU as International Mobile Technologies (IMT), WRCs serve an essential role in harmonising spectrum. Harmonsiation ensures economies of scale and facilitates planning for new spectrum bands to address data growth and deliver a bright future of sustainable connectivity.

Provide a stable and predictable regulatory environment needed for future investments

Ensure the rational, equitable, efficient and economical use of the radio-frequency spectrum and satellite-orbit resources

WRC-23 Outcome

The global treaty governing the use of the radio frequency spectrum, both on Earth and in space



Final Acts

- The Final Acts are the “output” document of the Conference.
- A total of 151 Member States signed the WRC-23 Final Acts.
- The Final Acts constitute a record of the decisions taken at the conference including both the new and revised provisions of the Radio Regulations, all Appendices, and the new and revised Resolutions and ITU-R Recommendations incorporated by reference into the treaty by the conference.

Radio Regulations 2024

- The **international treaty** on the **use of radio spectrum and satellite orbits**
- **The New RR will be published end 2024**

Qualcomm preparing for WRC-27

WRC-27 Cycle

We are here !

WRC-23 | CPM27-1 | ITU-R Study Groups | CPM27-2 | RA-27 | WRC-27

Dubai, 20 November to 15 December 2023

- Allocates the work of the agenda items to relevant study groups
- Defines chapter rapporteur and the structure of the CPM report

- Conducts studies for 4 years and prepares draft CPM text

ITU-R Study Groups:

- SG-1: **Spectrum** management
- SG-3: Radiowave **propagation**
- SG-4: **Satellite** services
- SG-5: **Terrestrial** services
- SG-6: **Broadcasting** service
- SG-7: **Science** services

Consolidates the CPM text that includes the methods to solve each agenda item

- Appoints the chairmans and vice charmans of the study groups
- Revises the structure of the study groups
- Approves or revises ITU-R resolutions.

ITUWRC DUBAI 2023

Regional Preparations for WRC-27

Topics on the WRC-27 Agenda

- 7 Agenda Items on FSS & BSS
- 1 Agenda Item on IMT
- 1 Agenda Item on Radiolocation
- 2 Agenda Items on MS & FS
- 4 Agenda Items on MSS
- 5 Agenda Items on Science
- 2 Agenda Items on General Issues

WRC-27 Agenda Items of Interest to the Cellular Community

Fixed satellite Service (WP 4A)

AI 1.1: A-ESIM and M-ESIM for GSO and NGSO in 47.2-50.2 GHz and 50.4-51.4 GHz
AI 1.2: Uplink FSS with small antenna in 13.75-14 GHz
AI1.3: to enable use of gateway earth station Tx to NGSO in 51.2-52.4 GHz
AI1.4: FSS allocation in 17.3-17.7 GHz, BSS in 17.3-17.8 GHz in R3
AI 1.5: limit the unauthorized operations of NGSO earth stations in the FSS and MSS
AI1.6: equitable access of FSS to 37.5-42.5 GHz, 42.5-43.5 GHz, 47.2-50.2 GHz and 50.4-51.4 GHz

Mobile satellite Service (WP 4C)

AI 1.11: space to space link in 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
AI 1.12: MSS allocation for Low-data-rate NGSO mobile satellite system in 1 427-1 432 MHz ,1 645.5-1 646.5 MHz, 1 880-1 920 MHz and 2 010-2 025 MHz
AI1.13: MSS allocation in IMT bands from 694/698 MHz-2700 MHz
AI1.14: Additional allocation to mobile satellite system in 2 010-2 025 MHz, 2 160-2 170 MHz and 2 120-2 160 MHz

Terrestrial Service (SG5)

AI 1.7: IMT band study in 4 400-4 800 MHz, 7 125-8 400 MHz (or parts thereof), and 14.8-15.35 GHz (**WP 5D**)
AI 1.8: radiolocation service in 231.5-275 GHz and in 275-700 GHz for mmW and submmW imaging system (**WP 5B**)
Uplink FSS with small antenna in 13.75-14 GHz
AI1.9: aeronautical mobile (OR) high frequency modernization in 3 025 kHz and 18 030 kHz (**WP5B**)
AI1.10: Article 21 pfd limit for FSS and MSS to protect fixed and mobile service in 71-76 GHz, 81-86 GHz (**WP 5C**)

Science Service (SG 7)

AI 1.15: communications on the lunar surface and between lunar orbit and the lunar surface (**WP 7B**)
AI 1.16: protect radio astronomy operating in specific Radio Quiet Zones (**WP 7B**)
AI1.17: receive-only space weather sensors (**WP 7C**)
AI1.18: protect EESS passive and radio astronomy above 76 GHz (**WP 7C**)
AI1.19: EESS passive in 4200-4400MHz and 8400-8500 MHz (**WP 7C**)

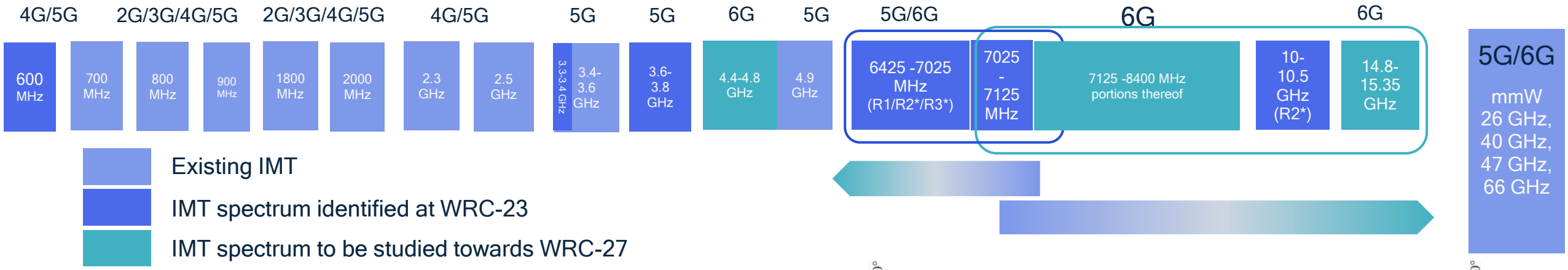
WRC-27 Agenda Item 1.7

Outline

- Introduction of AI 1.7
- Ongoing discussions at 5D
- Sharing studies (what , why, how etc.)
- The many proposed studies (as at 5D#46)
- How can countries be equipped/upskilled to be full contributors

IMT Bands: from 2G to 6G

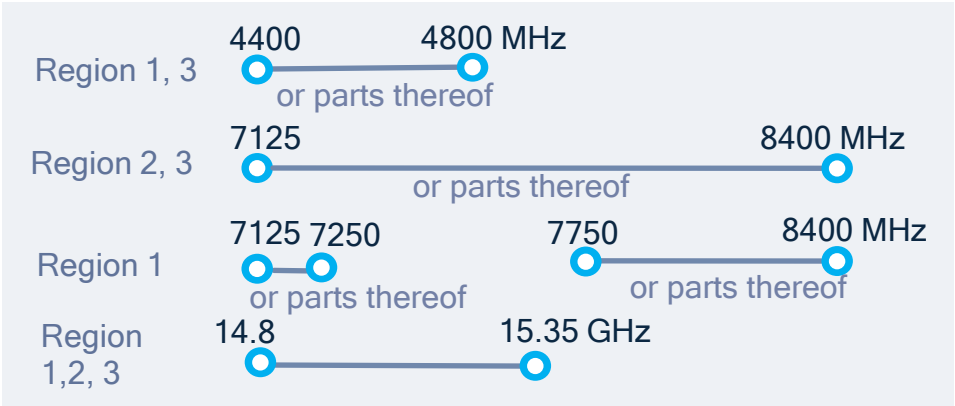
International Mobile Telecommunications (IMT) spectrum is the spectrum identified by ITU to be used for cellular technology. Not all cellular operators spectrum has been identified as IMT

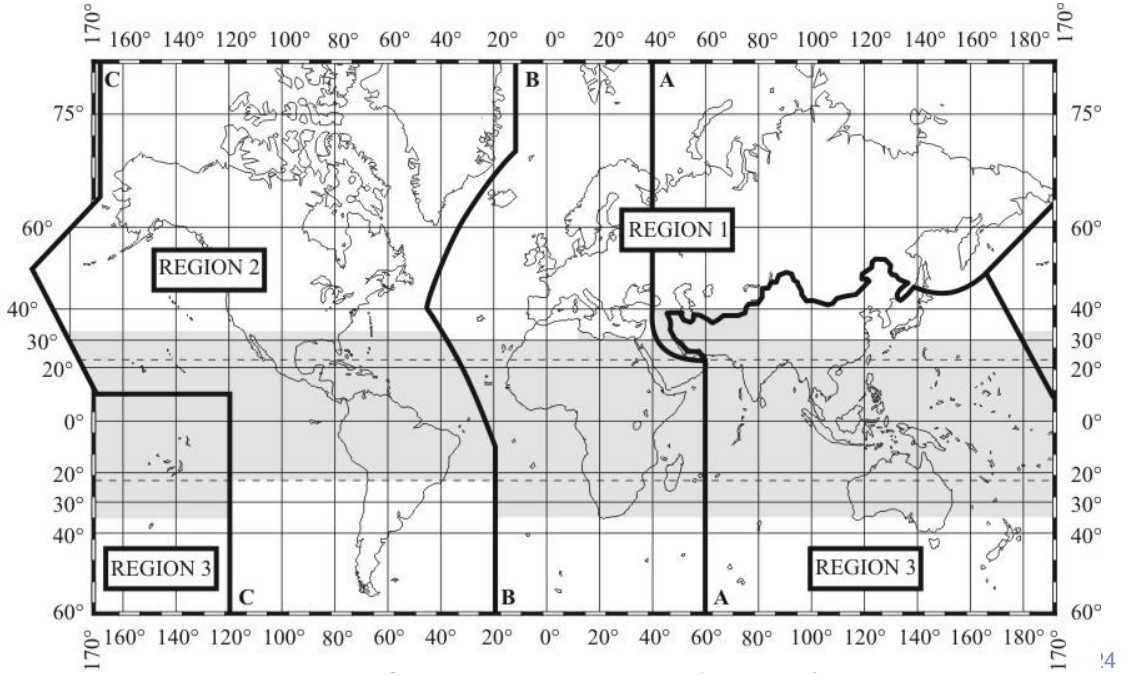


5G/6G

mmW
26 GHz,
40 GHz,
47 GHz,
66 GHz

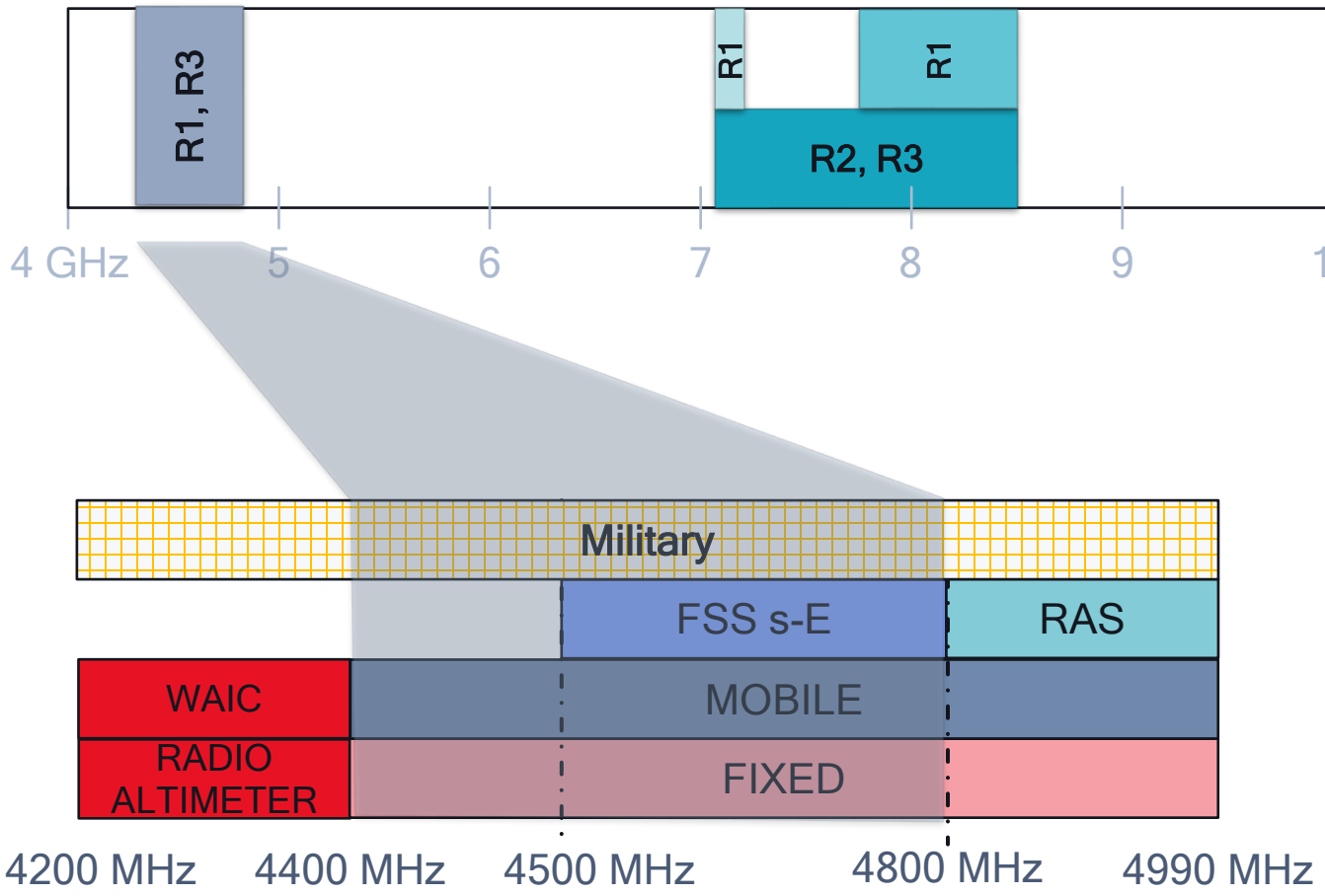
Administrations or Regions will **study** the following new candidate bands for use by 6G/IMT-2030 for decision in **WRC-27 Agenda item 1.7**





Overview of WRC 27 AI 1.7 – focus on 4.4-4.8 GHz

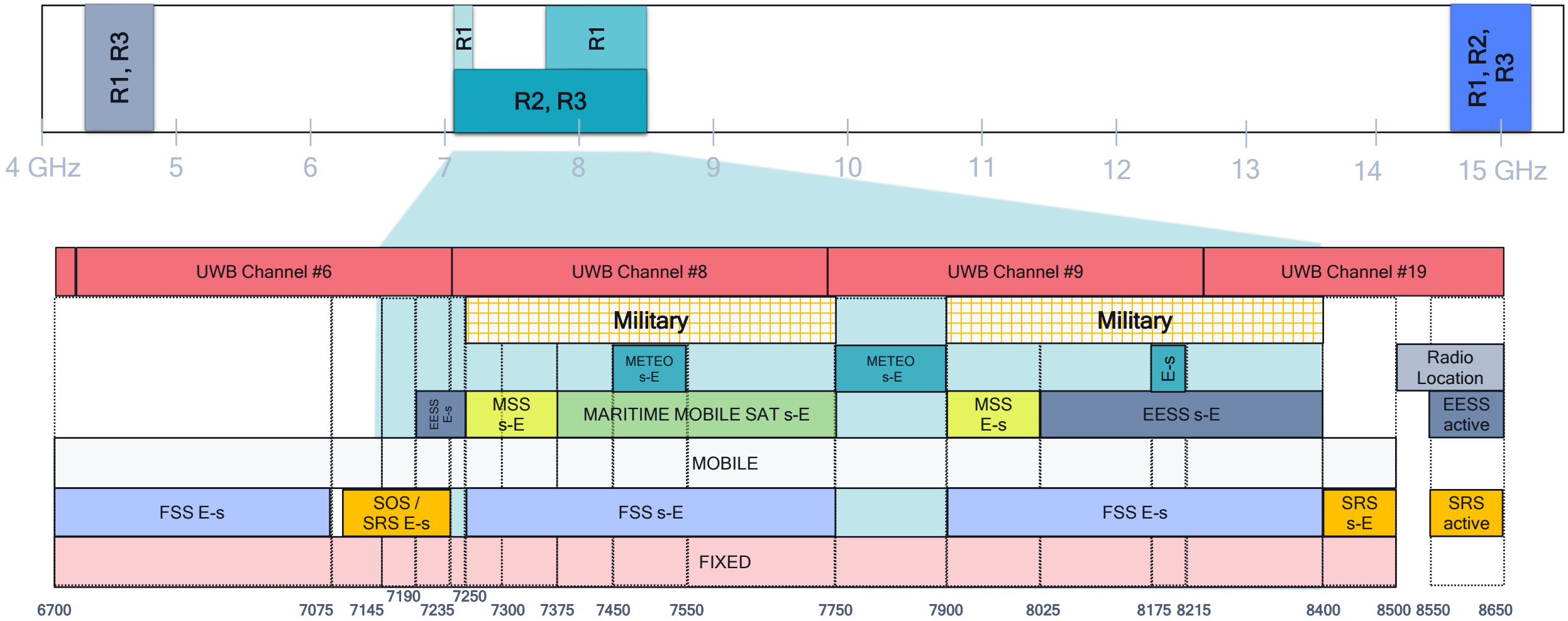
WRC-27 agenda item 1.7 considers International Mobile Telecommunications (IMT)



- Critical service in adjacent bands: Wireless avionics intra-communication (WAIC) systems and **Radio Altimeter** → implications: possible restrictions in terms of power and/or local limitations (e.g. airports, etc.)
- FSS DL, FS and RAS → implications: **coordination zones**
- **Military** (NATO usage) in Region 1 is used for Aeronautical, Land, Maritime and Telemetry systems → implications: opposition from NATO countries
- 4800-4990 is identified for IMT in some countries with a IMT BS **PFD limit** of -155 dBW/m2/MHz produced up to 19 km above sea level at 20 km from the coast, this limit to protect aeronautical service could serve as precedent

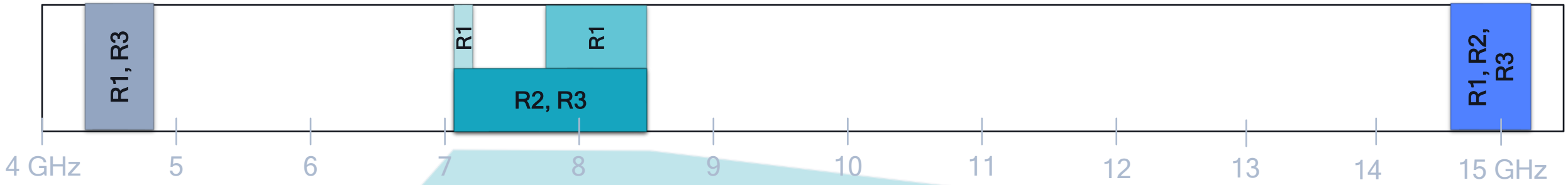
Overview of WRC 27 AI 1.7 – focus on 7.125-8.4 GHz

WRC-27 agenda item 1.7 considers International Mobile Telecommunications (IMT)



Overview of WRC 27 AI 1.7 – focus on 7.125-8.4 GHz

WRC-27 agenda item 1.7 considers International Mobile Telecommunications (IMT)

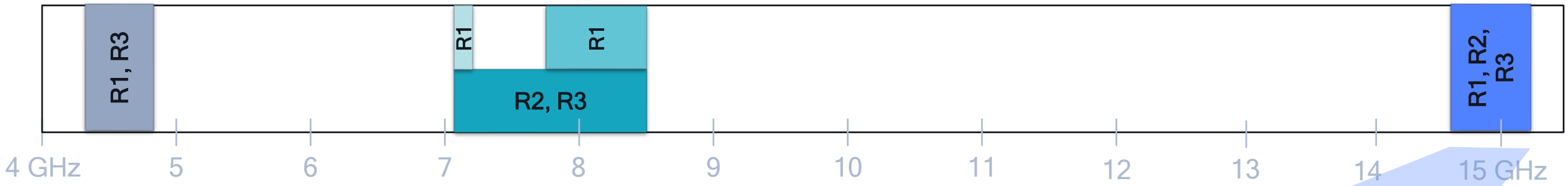


List of the critical aspects (only a subset)

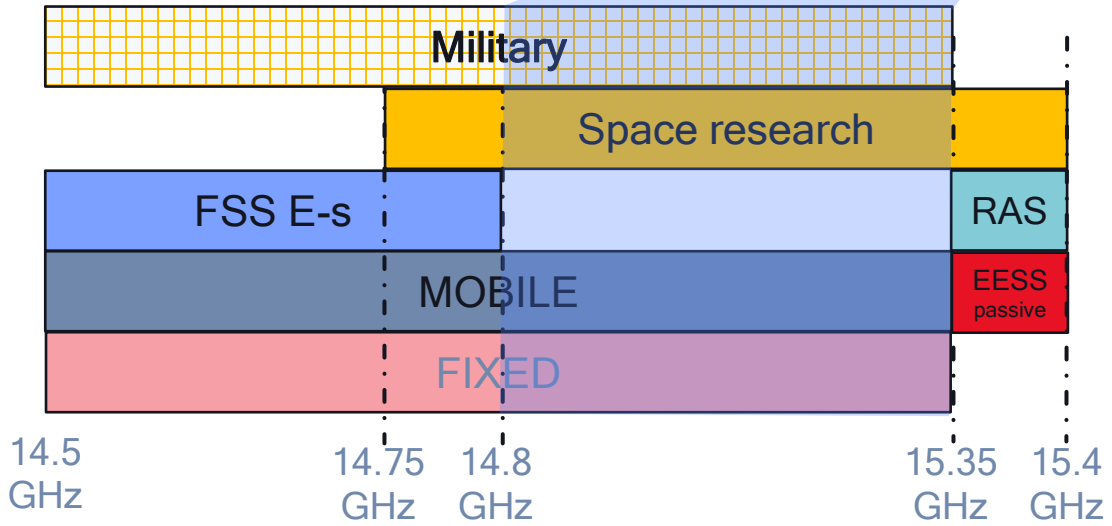
- **Military** and governmental usage of the band is the most critical issue, e.g. portable military systems operating in **FSS** and **MSS** spectrum. While **UL protection** (7.9-8.4) could be facilitated by EIRP mask, protecting **DL portable stations** (7.25-7.75) might be challenging
- **WMO** community is very aggressive (and effective in ITU-R context) in protecting EESS and MetSat operation
- There may be heavy usage of fixed service in some countries

Overview of WRC 27 AI 1.7

WRC-27 agenda item 1.7 considers International Mobile Telecommunications (IMT)

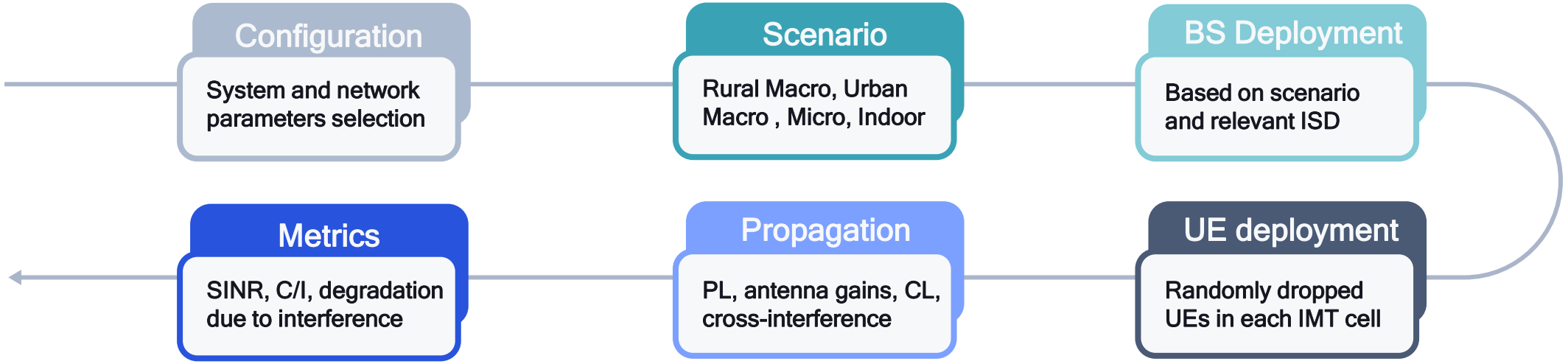


- Critical services → Space research (passive partially), EESS (passive) in adjacent band
- Other services like FS or RAS → from past cycle coordination zones could be needed
- Space research was recently upgraded to primary allocation in Region 1
- Military (NATO usage) in Region 1 is used for Aeronautical, Land and Maritime systems



Sharing Study – Technical Basis for Regulatory

- Sharing studies determines whether new systems can **share** the spectrum **with incumbent** systems
  - Based on minimum coupling loss (**MCL**) analysis and/or **Montecarlo** simulations
  - Both **co-channel** operation and coexistence in the **out-of-band** and spurious **domain**
  - Determine key **RF limits**, e.g., including in-band power and out-of-band emissions needed to protect incumbents
- Base Station emissions are typically the bottleneck, thus very strong participation from **infra vendors**
- Sharing studies are also used as a tool to promote specific **policy agenda**
  - e.g. the upper 6 GHz studies for IMT saw large participation from Wi-Fi community and satellite community
  - Consideration about sharing are also used to promote specific agendas, i.e. **new Generation** acceleration/deceleration

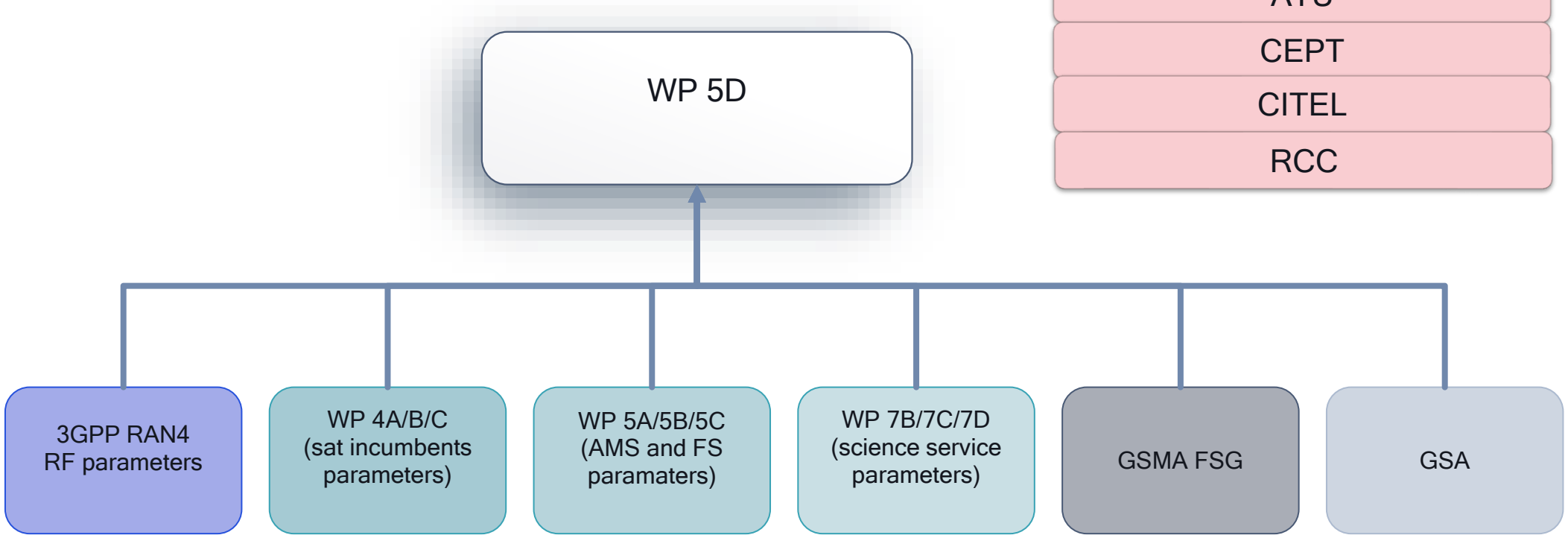


IMT Modelling is described in ITU-R recommendations

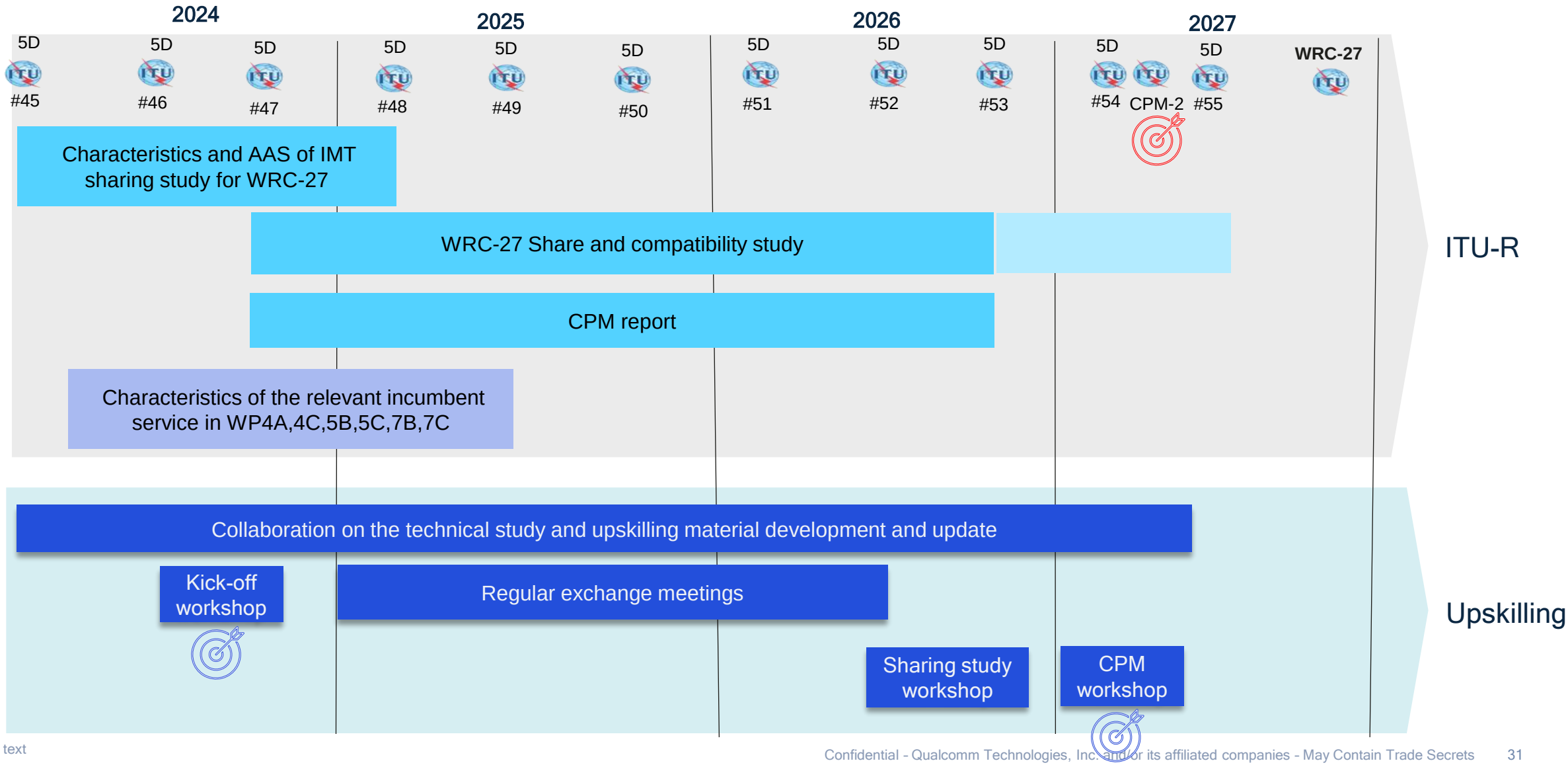
Ongoing Activities related to WRC-27 AI1.7 7.125 - 8.4 GHz

Regional organizations

APT
ASMG
ATU
CEPT
CITEL
RCC



Upskilling Program Timeline



Source sample text

Upskilling Process

Technical study and upskilling material development/update

- Conduct deterministic analysis and Monte-Carlo simulations
- Develop ITU-R Contributions
- Develop upskilling materials

Kick-off workshop (F2F)

- Establish the strategic collaboration on WRC-27AI 1.7
- Introduce the characteristics of IMT and incumbent service for WRC-27 AI1.7

Regulator exchange meetings (online or F2F)

- Upskill the regulators on simulation modeling and methodologies on the key sharing study
- Support the regulator to establish their own simulation platforms
- Provide suggestions on the sharing study of key scenarios and incumbent services
- Support on the simulation calibration
- Understand the technical concern from the regulators
- Communication on WP5D contribution preparation and exchange views

Sharing Study Report Workshop (online or F2F)

- Support the regulators to finalize the sharing study results
- Analyze the sharing study report
- Develop the views on the regulatory conditions

CPM workshop (F2F)

- Support the regulators to decide their choice on CPM regulatory methods on the IMT identification with favorable regulatory conditions

Objectives

- Strategic alignment
- Upskill the regulators on the characteristics of IMT and incumbent service, simulation modeling and methodologies on the key sharing study for AI1.7, especially for 7.125-8 GHz.
- Support the regulators to contribute on WRC-27 AI1.7 7.125-8 GHz sharing study in ITU-R WP5D and WRC-27